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46. 19 & 18

FORTY-THIRD ANNUAL REPORT

OF THE

OHIO

State Board of Agriculture,

WITH AN ABSTRACT OF THE PROCEEDINGS OF THE

COUNTY AGRICULTURAL SOCIETIES,

FOR THE YEAR 1888,

TO THE

General Assembly of the State of Ohio.

COLUMBUS:

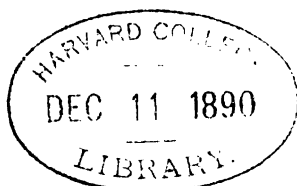
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REPORT

OF THE

Ohio State Board of Agriculture,

FOR THE YEAR 1888.

To the General Assembly of Ohio:

In compliance with section 3693 of the Revised Statutes, the Ohio State Board of Agriculture respectfully submits this, its forty-third annual report:

On pages 1 to 23, inclusive, will be found "proceedings for the past year;" on pages 25 to 56, inclusive, will be found "proceedings of the forty-fourth annual session of the Ohio State Agricultural Convention;" on pages 57 to 183, inclusive, will be found "an abstract of the proceedings of the several county Agricultural Societies." Papers and lectures before farmers' institutes will be found, beginning at page 186, followed after page 253 with a report of silo convention, and a summary of results of experiments with ensilage and corn fodder in feeding for milk and flesh. Statistical report on crops, for the year 1888, will be found on pages 308 and 347, inclusive.

The annual State Fair was one of the most complete and best classified exhibits of the agricultural and mechanical products of the State in its history. The addition of the art gallery and woman's building gives facilities for exhibiting works of art and education, and enables the women of Ohio to bring together in their own building, under their own management, the best of their own handiwork. The policy of the Board, of excluding from the grounds every exhibit or device of a demoralizing nature, has met the approval of all upright and intelligent citizens. It has demonstrated that games of chance, freaks of nature, monstrosities and fakirs are not requisite to the success or betterment of any agricultural and mechanical exhibit, and are not in harmony with the educating and stimulating influences of a well conducted fair.

Crop Reports have been issued at intervals, as the condition of the crops demanded. Condensed reports, furnished the associated press and county papers, have been made, instead of monthly pamphlet reports when consistent with the matter to be presented.

The work of sampling and analyzing commercial fertilizers has greatly increased the labor of this office, as the use of commercial fertilizers has doubled within four years. The great majority of fertilizers sold in the State are mainly shipped in the month of August; and a change in our method of issuing frequent reports during the summer season was necessary, as the number of samples was so large the chemist required more time to make his determinations. Accordingly, but one fertilizer report is made now at the close of the year. As fast as results are obtained, however, a slip is sent to the manufacturer, giving an advance report for his inspection and use.

This plan reduces the expense of printing frequent reports, and gives the information in a form at the end of the year, ready for the use of buyers and sellers of all the brands of fertilizers legitimately sold in the State. There may be an occasional new brand not yet reported, but these are very few, compared with the great number of standard brands.

The majority of manufacturers are careful to keep the standing of their goods uniform. Farmers and agents are generally unwilling to purchase brands whose value does not appear in this official report.

Farmers' Institutes were held during the months of November, December, January and February, in sixty counties. There were many applications for speakers, that we could not send, for want of funds. The demand is increasing, while the appropriation for the encouragement of agriculture has been reduced from \$6,000 to \$5,000.

By calling for volunteer speakers from the State Universities, the Agricultural Experiment Station, the State Grange, the State Horticultural Society, and by the aid of Commissioner John Hancock, LL. D., Superintendent Alston Ellis, LL. D., and others, and by limiting the number of speakers sent by the Board of Agriculture, and by urging local organizations to impress home talent, we have been able to keep the institute work going.

It is clear to every educator, familiar with the institute work, that we have in this annual course of Farmers' Institutes an educational factor of great value to the State, and worthy of its more liberal support. More than fifty thousand persons attended the institutes last winter—and the demand for institutes is increasing. Ohio is the pioneer State in this work, and since its inauguration in Ohio, neighboring States have taken up this work, and have invited Ohio men to come to their help, and we now find it difficult with our reduced appropriation to meet the demands

of our people, in this commendable work. Wisconsin has manifested her appreciation of Farmers' Institutes by appropriating annually the generous sum of \$12,000, for their support; Indiana, \$5,000; Minnesota, \$7,500; and these States employ the best talent they can secure from other States.

Ohio needs an increase of appropriation. Our people have borne their own expenses, and volunteered their services that the Institutes might not decline. They urge us to present their wishes and necessities, and they believe that the sum of three thousand dollars for Farmers' Institutes is not too much for the great State of Ohio to expend each year on these Institutes. This will make the appropriation for the encouragement of agriculture \$9,000 instead of \$6,000, as heretofore. With this sum, under the management of the Board of Agriculture, with no superintendent of institutes to be paid a salary, as in the States above named, it is believed the work can be wisely increased—for the lasting good of the State and advancement of its intelligence in agriculture, and all that goes to make better citizens.

The appropriation for the encouragement of agriculture has been most judiciously expended, and the interests of the producing classes would be furthered by an increase in the line indicated.

The appropriation for the contingent fund was reduced last winter, when the amount should have been enlarged to meet the increasing contingent expenses of this department. The contingent fund is not sufficient to meet the expenses of sending out the annual agricultural reports and other matter. Whenever a farmer, or librarian, or statistician writes for a report, we are compelled to write that on receipt of postage, we will forward the same. This increases labor, and stationery and postage expense, and prevents the distribution of reports, and other matter which the public has come to demand and appreciate.

All of which is very respectfully submitted.

L. N. BONHAM, *Sec'y.*

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OFFICERS AND MEMBERS OF THE BOARD.

OFFICERS FOR 1888.

JOHN POW, Salem, Columbiana county.....*President.*
J. G. RUSSELL, Mt. Gilead, Morrow county*Treasurer.*
L. N. BONHAM, Columbus, Franklin county.....*Secretary.*
JAS. W. FLEMING, Columbus, Franklin county*Assistant Secretary.*

MEMBERS FOR 1888.

J. H. BRIGHAM	Delta, Fulton county.
W. S. FOSTER.....	Urbana, Champaign county.
C. D. BAILEY.....	Gallipolis, Gallia county,
J. J. SULLIVAN	Millersburg, Holmes county.
J. H. TERRELL.....	N. Vienna, Clinton county.
S. H. HURST.....	Chillicothe, Ross county.
*H. G. TRYON	Willoughby, Lake county.
J. W. BLACK.....	Hanover, Licking county.

EXECUTIVE COMMITTEE FOR 1888.

JOHN POW, *President,* J. G. RUSSELL, W. S. FOSTER,
J. H. BRIGHAM. J. J. SULLIVAN.

OFFICERS FOR 1889.

JNO. POW, Salem, Columbiana county *President.*
J. G. RUSSELL, Mt. Gilead, Morrow county *Treasurer.*
L. N. BONHAM, Columbus, Franklin County..... *Secretary.*
J. W. FLEMING, Columbus, Franklin county..... *Assistant Secretary.*

MEMBERS FOR 1889.

J. H. BRIGHAM	Delta, Fulton county.
S. H. HURST.....	Chillicothe, Ross county.
*H. G. TRYON.....	Willoughby, Lake county.
J. M. BLACK.....	Hanover, Licking county.
A. H. KLING.....	Marion, Marion county.
H. S. GRIMES.....	Portsmouth, Scioto county.
A. J. CLARK.....	Cambridge, Guernsey county.
W. W. MILLER.....	Castalia, Erie county.

EXECUTIVE COMMITTEE FOR 1889.

JNO. POW, *President*, J. G. RUSSELL, *H. G. TRYON,
J. M. BLACK. A. H. KLING.

* Deceased.

LIST OF THE MEMBERS OF THE OHIO STATE BOARD OF AGRICULTURE.

FROM THE FIRST STATE FAIR TO THE YEAR 1888.

Members are elected to serve two years. The Board consists of ten members; [the term of service of five expires annually.]

Name.	Years of service, inclusive.	Post-office.
M. L. Sullivan†.....	1850-53	Columbus.
S. Medary†.....	1850-53	Columbus.
M. B. Bateham†.....	1850	Painesville.
D. Lapham†.....	1850	Cincinnati.
F. R. Elliott.....	1850-51	New York.
J. T. Pugsley.....	1850-51	Convenience.
Arthur Watts†.....	1850-52	Chillicothe.
J. M. Edwards.....	1850-52	Youngstown.
C. Springer†.....	1850-52	Meadow Grove.
J. G. Gest.....	1850-54	Xenia.
S. Halloway.....	1851	St. Clairsville.
Allen Trimble†.....	1850-51	Hillsborough.
William Case†.....	1852-53	Cleveland.
Philo Adams†.....	1852-53	Huron.
R. W. Musgrave†.....	1852-57	Sulphur Springs.
R. W. Steele.....	1853-56	Dayton.
William H. Ladd.....	1853-56	Brooklyn, N. Y.
D. McIntosh.....	1853-54	Shalersville.
J. T. Worthington†.....	1853-56	Chillicothe.
Joseph Sullivan†.....	1854-55	Columbus.
John K. Greene.....	1854-57	Cincinnati.
James L. Cox.....	1854-55	Zanesville.
B. Stedman†.....	1854-57	Washington, D. C.
Alexander Waddlet.....	1855-60	South Charleston.
Abel Krum.....	1855-58	Cherry Valley.
Lucien Buttlet†.....	1856-59	Columbus.
G. W. Barker†.....	1856-57	Marietta.
John M. Millikin†.....	1857-62	Hamilton.
Luther Smith.....	1857-58	West Liberty.
Thomas S. Webb.....	1857-58	Massillon.
Norton S. Townshend†.....	1858-63	Avon.
L. Q. Rawson.....	1858-59	Fremont.
James M. Trimble†.....	1858-61	Hillsborough.
John Reber†.....	1858-61	Lancaster.
D. E. Gardner†.....	1859-64	Toledo.
William Dewitt.....	1858-64	Cleveland.
C. W. Potwin.....	1859-62	Zanesville.
T. C. Jones.....	1860-67	Delaware.
Henry B. Perkins.....	1860-63	Warren.
David Taylor.....	1861-66	Columbus.
Jacob Egbert†.....	1862-63	Lebanon.
Nelson J. Turney†.....	1862-69	Circleville.
D. McMillan†.....	1863-70	Xenia.
W. R. Putnam.....	1863-64	Marietta.

LIST OF MEMBERS:

XV

MEMBERS OF THE STATE BOARD OF AGRICULTURE—Concluded.

Name.	Years of service, inclusive.	Postoffice.
William F. Greer†.....	1864-67	Painesville.
James Fullington†.....	1864-69	Irwin Station.
William B. McClung†.....	1864-71	Troy.
James W. Ross||.....	1865-70	Perrysburg
R. R. Donnelly†.....	1865-68	Wooster.
James Buckingham.....	1865-72	Zanesville
J. Park Alexander.....	1867-70	Akron.
Norton S. Townshend†.....	1868-69	Avon.
William Long.....	1868-71	Tiffin.
D. C. Richmond.....	1869-74	Sandusky.
R. P. Cannon.....	1870-75	Aurora.
James B. Jamison.....	1860-77	Cadiz.
L. G. Delano.....	1870-75	Chillicothe.
L. B. Sprague.....	1871-76	Springfield.
Simpson Harmount.....	1871-76	New Philadelphia.
John A. Warder†.....	1871-76	Cleves.
W. S. Hickox.....	1872-73	Mansfield.
B. W. Carlisle.....	1872-79	Hooker's Station.
Justus C. Stevens.....	1873-74	Kenton.
John M. Pugh.....	1874-79	Columbus.
L. B. Wing.....	1875-80	Newark.
Russell C. Thompson†.....	1875-76	Sylvania.
Leo Weltz.....	1876-84	Wilmington.
D. L. Pope.....	1876-81	Welshfield.
Chas. Smith.....	1877-80	Marion.
E. T. Stickney.....	1877-78	Republic.
A. E. Stone.....	1877-78	Gallipolis.
Peter Murphy.....	1877-80	Hughes' Station.
W. N. Cowden.....	1878-84	Quaker City.
R. Baker.....	1879-82	Elyria.
Arvine C. Walest†.....	1879-82	Massillon.
R. H. Hayman.....	1880-81	Portsmouth.
O. P. Chaney.....	1880-82	Canal Winchester.
C. D. Bailey.....	1881-88	Gallipolis.
J. C. Levering.....	1881-86	Leverings.
Wm. S. Foster.....	1881-88	Urbana.
L. B. Harris.....	1882-87	Upper Sandusky.
J. H. Brigham.....	1882	Delta.
L. N. Bonham.....	1883-86	Oxford.
H. Talcott.....	1883-87	Jefferson.
N. A. Sims.....	1883-84	Columbus.
T. P. Shields.....	1884-87	Watkins.
John Pow.....	1884	Salem.
S. H. Hurst.....	1884	Chillicothe.
J. J. Sullivan.....	1887-88	Millersburg.
Jos. H. Terrell.....	1887-88	New Vienna.
J. G. Russell.....	1887	Mt. Gilead.
H. G. Tryon†.....	1888	Willoughby.
J. M. Black.....	1888	Hanover.
A. H. Kling.....	1889	Marion.
H. S. Grimes.....	1889	Portsmouth.
A. J. Clark.....	1889	Cambridge.
W. W. Miller.....	1889	Castalia.

* The old members were re-elected in 1885 and in 1886; no change being made in the Board.

† Deceased.

‡ Removed to Columbus.

§ Removed to Caldwell, Kansas.

COUNTY FAIRS.

TABLE SHOWING THE PLACE AND RECEIPTS OF EACH STATE FAIR HELD; ALSO A LIST OF THE OFFICERS OF EACH YEAR OR FAIR.

Year.	President.	Treasurer.	Secretary.	Place of Fair.	Receipts.
1850.....	M. L. Sullivan ^c	Samuel Medary ^c	M. B. Bateham ^c	Cincinnati.....	\$8,086 13
1851.....	same.....	same.....	W. W. Mather.....	Columbus.....	8,204 09
1852.....	Arthur Watts ^c	same.....	same.....	Cleveland.....	13,360 00
1853.....	Samuel Medary ^c	M. L. Sullivan ^c	George Sprague.....	Dayton.....	13,996 37
1854.....	R. W. Musgrave ^c	Joseph Sullivan ^c	same.....	Newark.....	8,824 68
1855.....	J. T. Worthington ^c	same.....	same.....	Columbus.....	9,745 54
1856.....	William H. Ladd.....	Lucian Butts ^c	same.....	Cleveland.....	16,684 20
1857.....	Alexander Waddle ^c	same.....	John H. Klippart ^c	Cincinnati.....	17,530 75
1858.....	John M. Mullikin ^c	same.....	same.....	Sandusky.....	9,997 70
1859.....	N. S. Townshend.....	same.....	same.....	Zanesville.....	9,958 83
1860.....	Alexander Waddle.....	Charles T. Polwilt.....	same.....	Dayton.....	11,998 80
1861.....	Darwin E. Gardner ^c	same.....	same.....	Cleveland.....	8,036 18
1862.....	Thomas C. Jones.....	David Taylor.....	same.....	Cleveland.....	11,143 09
1863.....	N. S. Townshend.....	same.....	same.....	Columbus.....	12,620 54
1864.....	same.....	same.....	same.....	".....	10,958 65
1865.....	Wm. B. McClung.....	same.....	same.....	Dayton.....	11,083 60
1866.....	Daniel McMillan ^c	James Buckingham.....	same.....	Toledo.....	18,692 98
1867.....	James Fullington ^c	same.....	same.....	".....	13,606 25
1868.....	same.....	same.....	same.....	".....	19,406 60
1869.....	James W. Ross.....	J. Park Alexander.....	same.....	Springfield.....	18,252 25
1870.....	William Lang.....	James Buckingham.....	same.....	".....	16,460 25
1871.....	James Buckingham.....	Simpson Harcourt.....	same.....	Mansfield.....	19,149 45
1872.....	Lincoln G. Delano.....	same.....	same.....	".....	22,517 60
1873.....	same.....	same.....	same.....	Columbus.....	27,674 79
1874.....	R. P. Cannon.....	same.....	same.....	".....	20,589 80
1875.....	S. Harcourt.....	J. M. Pugh.....	same.....	".....	11,909 61
1876.....	J. B. Jamison.....	same.....	same.....	".....	21,151 21
1877.....	John M. Pugh.....	L. B. Wing.....	same.....	".....	11,979 60
1878.....	B. W. Carlisle.....	same.....	Jas. W. Fleming.....	".....	30,708 85
1879.....	D. L. Wing.....	same.....	W. I. Chamberlain.....	".....	23,682 20
1880.....	D. L. Pope.....	Leo Weltz.....	same.....	".....	29,706 16
1881.....	R. Baker.....	W. N. Cowden.....	same.....	".....	34,082 52
1882.....	W. N. Cowden.....	L. B. Harris.....	same.....	".....	38,513 78
1883.....	W. S. Foster.....	same.....	same.....	".....	33,306 48
1884.....	C. D. Bailey.....	J. C. Levering.....	same.....	".....	29,795 61
1885.....	L. N. Bonham.....	L. B. Harris.....	same.....	".....	30,533 17
1886.....	J. H. Brigham.....	same.....	L. N. Bonham.....	".....	30,902 10
1887.....	John Pow.....	same.....	same.....	Centennial year, no fair.....	.....
1888.....	.....	J. G. Russell.....	same.....	.....	.....

*Deceased.

reserved six months to July 1, when he died, and was succeeded by L. N. Bonham, of Oxford.

TRANSACTIONS

OF THE

State Board of Agriculture for the year 1888.

STATE AGRICULTURAL ROOMS,

January 11, 1888—10 A. M.

Board met. Present: Messrs. Brigham, Foster, Pow, Russell, Sullivan, Bailey, Black, Tryon and Hurst. The organization of the Board resulted as follows:

John Pow, of Columbiana county, was elected President.

J. G. Russell, of Morrow " " " Treasurer.

L. N. Bonham, Secretary, with salary of \$2,000.00.

Jas. W. Fleming, Assistant Secretary, with salary of \$1,500.00.

Frank Fleming, Clerk, with salary of \$750.00.

On motion of Mr. Brigham, an additional sum of \$500.00 was appropriated to the Institute work.

Adjourned.

L. N. BONHAM, *Secretary.*

January 12, 1888—8 A. M.

Board met. Present: Messrs. Pow, Russell, Bailey, Foster, Brigham, Hurst, Black and Tryon.

President Pow appointed the executive committee for the ensuing year: Messrs. Russell, Foster, Brigham, Sullivan and Pow.

On motion of Mr. Foster, the amount of the Treasurer's bond was fixed at \$25,000, and the Secretary was instructed to prepare bond for that amount.

An affidavit was filed with the Board by Mr. Foster, for Allen G. Edwards, charging C. C. Walker & Son, of New Madison, O., with having exhibited cattle at the Ohio State Fair of 1887, and previous years, under false pretenses.

State of Ohio, Franklin County, ss.:

Before me, the undersigned, a notary public, within and for said county, personally came Allen Edwards, of Youngstown, O., who, being duly sworn, says: That the Short-horn heifer Red Rose, of Sharon, 9th, recorded as produce of Red Rose, of Sharon, 4th, in A. H. B. Vol. 26, p. 1075.

The said Red Rose, of Sharon, 9th pedigree, also appears in full in the private catalogue of Abram Renick & Bros., of Kentucky, October, 1885, in which herd-book and private catalogue the said Red Rose, of Sharon, 9th, is shown to have been calved March 26, 1883.

Affiant further says, that on or about February, 1886, C. C. Walker & Son purchased the said heifer from the said Renicks, and that the said C. C. Walker & Son exhibited the said heifer Red Rose, of Sharon, 9th, at the Ohio State Fair, held in the fall of 1887, as the best heifer—three years and under four, whereas, in fact, the said heifer was over four years of age.

Affiant further says, that the said C. C. Walker & Son exhibited the said heifer Red Rose, of Sharon, 9th, at the Ohio State Fair, held in the fall of 1886, as best heifer two years and under three years, in the name of Poppy, 52d, whereas, Poppy, 52d, was calved December 27, and would have been only one year old.

Affiant further says, that the said C. C. Walker & Son exhibited at the Ohio State Fair, held in the fall of 1884, Acklam Sharon, 3d, as best bull one year and under two, whereas, said bull was calved July, 1882, as shown in vol. 26, p. 1074, A. H. B., and also recorded in vol. 26, as the property of C. C. Walker, thus showing that said bull was more than two years old when exhibited as a yearling, by the said C. C. Walker & Son.

Affiant further says, that C. C. Walker & Son made the false representations hereinbefore stated for the purpose of unfairly and fraudulently obtaining premiums at said exhibitions.

[NOTARIAL SEAL.]

(Signed)

ALLEN EDWARDS.

Sworn to before me, and subscribed in my presence, by the said Allen Edwards, on this 11th day of January, 1887.

JOHN F. ALFORD, *Notary Public.*

On motion of Mr. Brigham, the Secretary was instructed to furnish C. C. Walker & Son, and also Mr. Renick, from whom the cattle were purchased, a copy of the affidavit, and cite C. C. Walker & Son to answer to the charges at the next meeting of the Board, and notify them of the time of meeting as soon as agreed upon.

On motion of Mr. Foster, it was

Resolved, That this Board execute its note by the President and Treasurer, officially, and the members as individuals in the sum of \$10,000. And the Treasurer is hereby authorized to borrow that amount and devote the sum borrowed to liquidating the overdraft of the Board at the P. Hayden & Co.'s Bank, and for the payment of accumulated bills, and other necessary expenses of the Board in the transaction of official business.

After an interview with E. P. Stewart, the cashier of the P. Hayden & Co.'s Bank, the Secretary stated that such a note as the Board proposed would be accepted, with the rate of interest to be 7 per cent., and the interest payable July 1, and at maturity on or before September 10, 1888, and the Secretary furnishing a copy of above resolution, and his certificate, that the same had been adopted by the Board of Agriculture at its meeting January 12, 1888.

Adjourned to meet at the call of the President.

L. N. BONHAM, *Secretary*.

Jno. Pow, *President*.

STATE AGRICULTURAL ROOMS,

March 20, 1888—7:30 P. M.

A joint meeting of the State Board of Agriculture and Ohio Centennial Board of Directors having been called, the following members were present: Messrs. Brigham, Foster, Black, Hurst, Pow, Terrell, Russell, Tryon, Chittenden, Levering and Talcott.

On motion of Mr. Brigham, Mr. Chittenden took the chair. The Chairman stated the object of the meeting to be to devise means for the erection of suitable buildings, and to arrange for a proper exhibition during the coming Centennial.

The suggestions of the Chairman were discussed at length by the members, but in view of the want of action by the Legislature on the Tryon bill, which asks that the Sinking Fund Commissioners issue certificates to the amount of \$100,000, to enable the State to hold a suitable Centennial exhibition, the Boards were not prepared to take any definite action on the amount to be expended for buildings.

Mr. Tryon suggested that the members of the two Boards should meet the Finance Committee of the House and press the passage of the Tryon bill. It was agreed that Mr. Tryon should arrange with the Finance Committee for such meeting.

Adjourned until 9 A. M., Wednesday, March 21.

WEDNESDAY—9 A. M.

A quorum not present the meeting adjourned.

WEDNESDAY—1:30 P. M.

The Board of Agriculture met, President Pow in the chair. Present: Foster, Black, Russell and Hurst. Messrs. Brigham and Talcott coming in later.

The Secretary suggested that the buildings north and south of the show-ring of the Swine Department could be spared for other uses, and as there would be great need for more dining-rooms, these could be moved to suitable locations on the grounds, and remodeled at a little expense so as to make two comfortable dining-rooms.

On motion of Mr. Russell, the suggestion was approved, and left for the action of the Centennial Committee of Improvements.

After extended discussion of the need, and ways and means of improvement of streets leading to the Centennial Grounds, it was voted that it is the sense of the Board that the Secretary and his assistant be authorized to pledge, if necessary, the grading of the street from the south-east gate to the Columbus and Eastern Railway, provided the other parties in interest on each side of the street and the C. & E. Railway Company will agree to put on a suitable amount and kind of metal to make a good road.

Mr. Foster offered the following, and moved their adoption:

WHEREAS, The Ohio Centennial will attract to Columbus, during its progress, hundreds of thousands of visitors from all parts of the United States; and

WHEREAS, It would be to the credit of the city, and to the convenience of her guests, that all the streets and avenues leading to the Exposition Park be placed in good condition for travel, and especially Woodward avenue, from High street to the Harbor road and Eighth street extension, leading directly to the south-east entrance, which streets are now almost impassable during wet weather; and

WHEREAS, Owing to the night exhibitions to be given on the grounds, and the G. A. R. encampment to be located and accommodated near the grounds, it would be most convenient to have electric lights established along Woodward avenue and Eighth street to the C. & E. passenger depot; and

WHEREAS, Including the Exposition Grounds (or State Fair Grounds, properly named,) in the corporate limits of the city would more properly secure water-service, fire and police protection, and other conveniences that could be provided only by city authority; therefore,

Resolved, First, that the Honorable City Council of Columbus and the Board of Trade be earnestly requested to take such steps as will secure these necessary improvements and conveniences' and second,

Resolved, That a copy of this action be transmitted to the President of the City Council and the President of the Board of Trade.

General Hurst moved that it be laid on the table, which, having carried, Mr. Russell moved that the whereas, pertaining to including the fair grounds in the corporate limits of the city of Columbus, be stricken out, and the remainder be adopted. Carried unanimously.

It was stated by the Secretary, that Mr. Chittenden was about to go

East and could see Mr. Bonner, without cost, about sending Maud S. the Centennial Exposition.

On motion of Mr. Foster, the Secretary was instructed to write to Mr. Chittenden, at New York, informing him of the Board's action, requesting him to use his best endeavors to secure the presence of Maud S. for at least one week during the Centennial.

Mr. Pow inquired why stationery had not been sent to members of the Board. The Secretary answered, that the office had been using Centennial envelopes and letter heads to advertise that Exposition, and had not drawn envelopes from the Secretary of State. He suggested that if stationery was ordered for the Board of Agriculture the cut of the Centennial envelopes be used thereon.

On motion of Mr. Foster, such stationery should be prepared for the members of the Board of Agriculture, and forwarded with stamps.

Adjourned to meet at the call of the President.

L. N. BONHAM, *Secretary*.

JNO. POW, *President*.

TUESDAY EVENING, *March 20, 1888.*

Joint meeting of the State Board of Agriculture and Centennial Board. Present, from the State Board of Agriculture: Messrs. Brigham, Foster, Black, Hurst, Pow, Terrell, Russell and Tryon.

Present, from the Centennial Board: Messrs. Chittenden, Hurst, Levering, Foster and Talcott. Mr. Chittenden in the chair.

The Chairman stated that the object of the meeting was to discuss means and measures for the erection of suitable buildings, and for providing for a proper exhibit therein during the coming Centennial.

The points presented were discussed by the members of each Board, and it was, on motion,

Resolved, That the Boards, jointly, meet the House Finance Committee to-morrow, to confer with said committee regarding matters relating to the Centennial now pending before the Legislature.

On motion, the meeting then adjourned until 9 A. M. of the following day:

WEDNESDAY, *March 21, 1888.*

The meeting was called to order. A quorum not being present, adjournment was taken without further action.

A. A. GRAHAM, *Assistant Secretary*.

H. T. CHITTENDEN, *Chairman*.

STATE AGRICULTURAL ROOMS, *April 16, 1888.*

Pursuant to call, Board met. Present: Messrs. Pow, Foster, Hurst, Tryon, Black and Russell. After reading of the minutes of preceding meeting, on motion of Mr. Foster, the Secretary was authorized to appoint such number of deputies as he may need to inspect and sample fertilizers.

The case of C. C. Walker & Son was taken up. The Secretary stated that Mr. Walker had received the first notice of the Board, as evidenced by the following letter:

LETTER.

NEW MADISON, OHIO, *March 19, 1888.*

GENTLEMEN: Your favor of the 16th received. I am sorry to inform you that it is impossible to meet you at the time stated, or on such short notice, but can meet you any time in June.

If this meets your approval, I will be glad to hear from you. Please send me word, and oblige the same.

Very respectfully yours,

C. C. WALKER.

Second, that early in April the Secretary had notified Messrs. Walker & Son that the Board would meet near the middle of April to consider the charges against them.

After waiting until 9 P. M., in the hope that defendant might put in an appearance, the case of C. C. Walker & Son was taken up.

The Secretary stated that the firm had been duly notified of the meeting of the Board in March, and he had received a letter stating that they could not meet the Board on so short a notice.

Also, the Secretary had written C. C. Walker & Son that the Board would meet about the middle of April to act upon their case, and that as soon as the exact date of meeting was fixed they would be duly informed. The Secretary stated that the call for the meeting was sent by the same mail with the notice sent to C. C. Walker & Son.

The gentlemen were not present, nor had any word been received from them. A copy of the charges made in the affidavit of Mr. Allen Edwards had been furnished to C. C. Walker & Son some months since.

The Secretary averred that he had used all diligence and care to have C. C. Walker & Son duly notified.

Mr. Russell offered the following, and moved its adoption, which was carried unanimously:

WHEREAS, Allen Edwards, of Youngstown, O., made the following affidavit (copy given in minutes of January 12, 1888), a copy of which was sent, and immediately after the January meeting of the Board of Agriculture, the charges therein made and corroborated by common fame, and the evidence of Mr. Renick, of Kentucky; and

WHEREAS, C. C. Walker & Son have twice been formally notified to appear, and

make answer to the charge of fraudulently exhibiting cattle at the Ohio State Fair; and
WHEREAS, The said C. C. Walker & Son have failed to appear or make answer; therefore,

Resolved, That Rule IV, of the General Instructions to Committees of the Ohio State Fair, be enforced as to C. C. Walker & Son, and that the Secretary be hereby instructed to notify said firm of this action.

The bond of Jno. G. Russell, in the sum of \$25,000, was examined and approved.

Adjourned to 8:30 A. M., April 17.

L. N. BONHAM, *Secretary*.

ROOMS OF STATE BOARD OF AGRICULTURE,

April 17, 1888—8:30 A. M.

Board met pursuant to adjournment. Present: Messrs. Pow, Hurst, Russell, Bailey, Black and Foster.

Mr. Foster offered the following resolution, which was adopted:

Resolved, That the Ohio State Board of Agriculture recommend that in the erection of buildings upon the Fair Grounds, that the Centennial Board, as far as is possible, erect such as will be useful for Fair purposes in the future.

Mr. Foster also moved, and it was voted, that by all means an amphitheater for the cattle department should be erected.

Mr. Bradley, of the Foos Manufacturing Company, of Springfield, was present to secure space for the erection of a building in which to exhibit the wares of said company. He was invited to meet the Board at the Fair Grounds at 1:30 P. M., to which time and place recess was taken.

L. N. BONHAM, *Secretary*.

1:30 P. M.

The Board met on the State Fair Grounds.

Mr. Bradley advocated earnestly a change of the plans of the grounds so as to allow building south of the Champion building, rather than east. The Board declined to give an answer until further consideration.

The Boards, jointly, with Mr. Chittenden acting as Chairman, proceeded to view the grounds with the view to locating the several buildings to be erected for the Centennial Exposition.

The Hall for Commerce and Transportation was, on motion of Mr. Harris, located on the plat east of the East Lake.

That of Printing and Journalism was, on motion of Mr. Russell, located on Press Row, east of the Journal office.

That of Mining and Metallurgy was, on motion of Gen. Hurst, located north of Hayden Building, on lot occupied by an old coal exhibit.

That of Women's Department was, on motion of Gen. Hurst, located east of North Annex.

The Auditorium was, on motion of Mr. Black, located east of Central Building.

Art Hall was located east of South Annex and south of Auditorium.

The large building for Agriculture, Horticulture and Floriculture, was located on east side of land leased from Mr. Innis.

The Cattle Amphitheater was, on motion of Mr. Foster, located on the site of the cattle ring, south of the scales.

Stables for cows in the Dairy Test were located on Innis' tract, near to the C. C. C. & I. Railway, and the Creamery east of stables at a convenient distance.

The Boards returned to the city and took recess until 7:30 P. M.

L. N. BONHAM, *Secretary.*

STATE AGRICULTURAL ROOMS, *April 17, 1888.*

Joint meeting of Ohio State Board of Agriculture and the Ohio Centennial Board.

Present from State Board of Agriculture: Messrs. Tryon, Pow, Black, Russell, Hurst and Foster. From Ohio Centennial Board: Messrs. Chittenden, Hurst, Levering, Bailey and Foster, Mr. Chittenden in the chair. Minutes of joint meeting of March 20th read and approved. Secretary Bonham presented the bond of the Treasurer, Mr. L. B. Harris, in the sum of \$200,000, which, on motion of Mr. Foster, was approved.

The question of estimates for expenses was discussed, and was referred to a committee, consisting of Messrs. Bonham, Hurst and Fleming.

The question of the sale of pools was presented by the Secretary.

On motion of Mr. Levering, it was decided not to sell pools during the Exposition.

The Secretary was authorized to procure a lawn mower, and to sell or exchange the mower now owned by the Board of Agriculture and used on the grounds.

Examination of the appropriation of the \$20,000 made by the State, showed that the same was payable to the State Board of Agriculture.

The Secretary read a communication from the Fitchburg Steam Engine Company, relative to setting an engine and boiler to be used in machinery hall during the Centennial. On motion the proposal was referred to the Executive Committee for further consideration.

General Hurst offered the following resolutions, adopted at a meeting of the State Board of Agriculture:

Resolved, That in lieu of the stipulations heretofore entered into between the State Board of Agriculture and the Board of Ohio Centennial Directors, the following be substituted:

1st. Out of the first proceeds of the Centennial Exposition there shall be paid to the State Board of Agriculture the sum of \$12,500. Next to this sum shall be paid out of the first receipts of the Exposition, such sum or amount, not exceeding forty-two thousand dollars (\$42,000), as may be necessary to complete the Centennial buildings. Next after the payment of such sums as may be paid for building within the foregoing limits, shall be paid to the Board of Agriculture the sum of \$12,000, thereby completing the payment of \$24,500 stipulated heretofore to be paid to the State Board of Agriculture, for the rental of grounds and the salaries of clerical forces.

The foregoing resolution was, on motion adopted.

On motion of Mr. Foster, the Secretary was instructed to write Mr. Delano, Commissioner of Department of Live Stock, as to arrangements made concerning the appointment of Mr. J. M. Black, as Superintendent of the Feed Department during the Centennial.

On motion of Mr. Foster, it was resolved to offer premiums for best yearling steers, best two years old, best three years old or over, of any breed, as follows:

	First.	Second.
Best fat bullock, 3 years old and over	\$30 00	\$20 00
“ “ steer, 2 years old and under 3.....	30 00	20 00
“ “ “ 1 year old and under 2.....	20 00	10 00
“ “ “ 1 year and under.....	30 00	20 00

The Board then took a recess until 7:30 P. M., the afternoon to be spent at the grounds.

L. N. BONHAM, *Secretary*.

7:30 P. M.

The Chair presented the question of finance.

Mr. Wm. G. Deshler and Mr. J. H. Stewart (by invitation) being present, a statement was also made by Mr. Pow, President of the State Board of Agriculture.

On motion of Mr. Foster, the following resolution was adopted:

WHEREAS, The attention of Mr. A. A. Graham, the Commissioner in charge of the Historical Department, will soon be demanded in working up the details of that department; and

WHEREAS, Mr. Graham is also occupying the position of Assistant Secretary;

Resolved, That he be relieved from the duties of said office, and that the salary for the same cease on the first day of May, 1888, after which date he shall assume charge of the Historical Department upon the same terms and conditions as the Commissioners of other departments, and be subject to the same rules and directions.

The subject of abandoning the rooms on High street, now occupied by the Director General and Assistant Secretary Graham, was discussed, and postponed until to-morrow for further action.

On motion of Mr. Foster, Mr. Russell was appointed Superintendent of Gates and Gate-keepers.

On motion, the Board adjourned until 8 A. M., Wednesday.

L. N. BONHAM, *Secretary*.

WEDNESDAY, April 17, 1888—8 A. M.

Joint Boards reconvened. Present: Messrs. Hurst, Bailey, Black, Harris, Foster, Levering, Pow and Russell. Mr. Bailey was called to the chair.

Architect Terrell presented plans for the buildings proposed to be erected on the State Fair Grounds for the Centennial Exposition.

The plans were discussed and amended.

On motion of Mr. Black, the plan for Cattle Amphitheater was approved, with a band stand to be added over the central entrance.

The plan for the Agricultural Hall, with annexes for Horticultural and Floricultural exhibits was approved, after changing side doors of annexes to the junction of the Agricultural Hall.

The plan of Mining Hall approved, after leaving 30 feet open at each end and enclosing 30 feet in the center of the building, reducing the cost to \$1,200.

On motion of Mr. Harris, Carriage Hall plan was approved, excepting there are to be no floors and platforms.

The building for Women's Department is to be permanent and built according to the plans presented.

On motion of Mr. Pow, the general plan for the several buildings, viz.: Cattle Amphitheater, Agricultural Hall and its annexes, Mining Hall, Carriage Hall, Women's Department, Art Hall, Dairy and Creamery, Printing and Journalism Hall, were approved.

On motion of Gen. Hurst, an amount not to exceed \$1,500 was appropriated, to cover the entire cost of the Art exhibit, and that to include amount already expended or contracted for by the Commissioner of that department.

On motion of Mr. Foster, the Commissioner of the Department of History and Archæology, will be allowed thirty days' time for collecting and securing the exhibits for that department.

Mr. Graham suggested that the time was too short. Gen. Hurst then proposed that Mr. Graham be allowed the remainder of this month of

April, and be excused from secretary work, to which proposition there was no objection.

On motion of Mr. Foster, the office of the Centennial shall be located in the State Board of Agriculture's Rooms, and the rooms now occupied in the King building be sub-let, or the lease surrendered May 1, if that can be satisfactorily arranged with the lessor.

It was ordered that the Centennial Board meet April 25, at 7 P. M., to consider bids and let contracts for erection of proposed buildings, and that the Executive Committee of the Board of Agriculture be invited to meet at the same time.

On motion of Mr. Foster, it was voted that the Centennial Board request action for opening the street from Central gate of Fair Grounds on Woodward avenue, south to Fifth avenue.

At the suggestion of the Secretary, Mr. Chittenden was made a committee of one, to confer with the Gas and Electric Light Company, in regard to furnishing light during the Exposition, on the Centennial Grounds, and to report at next meeting of the Board.

Adjourned.

L. N. BONHAM, *Secretary.*

STATE BOARD OF AGRICULTURE,

TUESDAY EVENING, *May 22, 1888.*

The Board met in pursuance to call; there being present, President Pow, and Messrs. Black, Foster, Russell, Brigham, Sullivan, Hurst and Bailey. Absent: Messrs. Terrell and Tryon.

The Board was called to order by the President.

The Secretary read the minutes of the preceding meeting, which, on motion, were corrected by expunging therefrom the resolutions relative to payment of moneys contemplated to be borrowed for the erection of buildings on the Fair Grounds, the money not having been realized in the manner contemplated when the resolution was discussed, but not adopted.

After correction on one or two other minor points, the minutes were approved.

The following preamble and resolution was, on motion of Mr. Russell, adopted:

WHEREAS, On the 16th day of April, A. D. 1888, the General Assembly of the State of Ohio enacted a law entitled, "An act to authorize the Ohio State Board of Agriculture to issue bonds for Fair Ground improvement, and to aid the Ohio Centennial Exposition," whereby the Ohio State Board of Agriculture was authorized to issue

bonds, not to exceed in the aggregate the sum of \$50,000, or of so much of said sum as they might deem necessary to aid the Ohio Centennial Commissioners in erecting buildings on the Ohio State Fair Grounds, and whereby further, the said the Ohio State Board of Agriculture was authorized, if they deemed it necessary, to secure the payment of said bonds and interest by a mortgage of its real estate with the improvements thereon; and

WHEREAS, The said the Ohio State Board of Agriculture deem it necessary to borrow and issue bonds for the sum of thirty thousand dollars (\$30,000), for the purpose set forth in said act, and to mortgage its real estate hereinafter described, with the improvements thereon, to secure the payment of said bonds; now, therefore, it is hereby

Resolved, That for the purpose aforesaid, the Ohio State Board of Agriculture hereby directs its President and Secretary to execute and acknowledge in its name six (6) several promissory bonds of five thousand dollars (\$5,000) each, payable January 1, A. D. 1889, with interest from June 1, A. D. 1888, as also a mortgage on the premises of the Ohio State Board of Agriculture contained within its Fair Ground, in Franklin county, Ohio, adjoining the city of Columbus, O., situate in section 4, township 1, range 18, United States Military Lands, and containing ninety and forty-three one-hundredths ($90\frac{43}{100}$) acres, more or less, to secure the said six (6) bonds to Edward K. Stewart, Trustee. And it is further ordered, that said Edward K. Stewart, as Trustee, shall sell said six bonds at not less than par for cash, and assign the same without recourse on him to the purchaser or purchasers thereof, and place the proceeds thereof to the credit of the Treasurer of the Ohio State Board of Agriculture for the use of the Ohio Centennial Exposition as provided in said statute.

In accordance with the resolution authorizing the issuing of notes and execution of a mortgage to secure the payment of same, a mortgage in form as follows was agreed upon:

WHEREAS, On the 16th day of April, A. D. 1888, the General Assembly of the State of Ohio enacted a law, entitled, "An act to authorize the Ohio State Board of Agriculture to issue bonds for Fair Ground improvement, and to aid the Ohio Centennial Exposition," whereby the Ohio State Board of Agriculture was authorized to issue bonds not to exceed in the aggregate the sum of fifty thousand dollars (\$50,000), or so much of said sum as they might deem necessary to aid the Ohio Centennial Commissioners in erecting buildings on the State Fair Grounds, and whereby further, the said the Ohio State Board of Agriculture was authorized, if they deemed it necessary, to secure the payment of said bonds and interest by a mortgage of its real estate, with the improvements thereon; and

WHEREAS, The said the Ohio State Board of Agriculture deem it necessary to borrow and issue bonds for the sum of thirty thousand dollars (\$30,000), for the purpose set forth in said act, and to mortgage its real estate hereinafter described, with the improvements thereon, to secure the payment of said bonds; and

WHEREAS, The said the Ohio State Board of Agriculture did direct its President and Secretary to issue its six promissory notes or bonds of five thousand dollars (\$5,000) each, and to execute a mortgage to secure the same to Edward K. Stewart, Trustee, by resolutions, which were duly adopted by said the Ohio State Board of Agriculture, at a meeting held by them on the 22d day of May, A. D. 1888, as by reference to record of said meeting will more fully appear. Now, therefore, know ye, that in pursuance of said law and resolution, the Ohio State Board of Agriculture hath sold, and by these presents doth grant, bargain, sell and convey, unto said Edward K. Stewart, Trustee, of the city of Columbus, county of Franklin and State of Ohio, in consideration of the sum of thirty thousand dollars (\$30,000), all their real estate, with the improvements thereon, in the county of Franklin and State of Ohio, and in the township of Clinton, known as the State Fair Ground, and more fully described as follows, to-wit: Beginning at a stone at the intersection of the north line of Woodward avenue, and the east line of the right of way of the C. C. C. & I. R. R.; thence N. 3° 20', W. 88.50 poles on the said R.

R. line right of way to a stone; thence S. 87° 05', E. 58.68 poles to a stone; thence N. 2° 50', E. 63.68 poles to a stone; thence S. 87° 05', E. 56.12 poles to a stone; thence S. 2° 50', W. 101.56 poles to a stone; thence S. 87°, 23.52 poles to a stone; thence 2° 15', W. 50.32 poles to a stone in the north line of Woodward avenue, extended; thence with the said line N. 87° 05', W. 129 poles to the beginning, containing ninety and forty-three one-hundredths ($90\frac{43}{100}$) acres of land, situate in the 4th section, township 1, range 18, United States Military Lands, known as Clinton township. To have and hold said land and improvements, to said Edward K. Stewart, Trustee, his successors, heirs and assigns, forever; provided, however, and these presents are upon this express condition, that

WHEREAS, In pursuance of said enactment and resolution, and with the purposes thereof, that said the Ohio State Board of Agriculture has, on this 22d day of May, A. D. 1888, executed and delivered to said Edward K. Stewart, Trustee, as aforesaid, said six (6) several and uniform promissory bonds or notes, each for the sum of five thousand dollars (\$5,000), all payable on the 1st day of January, A. D. 1889, and all bearing interest at the rate of six per cent. (6%) per annum, payable annually, from the 1st day of June, A. D. 1888. Now, if the Ohio State Board of Agriculture, or any one for it, shall pay to said Edward K. Stewart, Trustee, or his assigns, each of said bonds or notes, and interest thereon, as and when they severally become due, then this conveyance shall be void; otherwise, it shall be and remain in full force and effect in law.

In witness whereof, the said the Ohio State Board of Agriculture has hereunto set its signature, and affixed its seal by the hands of its officers thereunto authorized, to-wit: by the hands of John Pow, its President, and Lazarus N. Bonham, its Secretary, this 22d day of May, A. D. 1888.

Signed, sealed, acknowledged and delivered
in our presence:

N. HARTE CALDWELL,
JAS. W. FLEMING.

JOHN POW, [SEAL.]
President Ohio State Board of Agriculture.
LAZARUS N. BONHAM, [SEAL.]
Secretary Ohio State Board of Agriculture.

State of Ohio, Franklin County, ss.:

Before me, Jas. W. Fleming, a Notary Public, in and for said county, this day came the Ohio State Board of Agriculture, by its duly authorized officers, John Pow, President, and Lazarus N. Bonham, Secretary, and said John Pow, President, and Lazarus N. Bonham, Secretary, and acknowledged the signing, sealing and delivering of the above mortgage deed for purpose therein expressed.

As witness my hand and notarial seal, this 22d day of May, A. D. 1888.

JAMES W. FLEMING, *Notary Public.*

The notes to be issued were approved in form as follows:

COLUMBUS, OHIO, *May 22, 1888.*

Under, and by authority of an act passed by the General Assembly of the State of Ohio, April 16, 1888, and entitled, "An act to authorize the Ohio State Board of Agriculture to issue bonds for Fair Ground improvement, and to aid the Ohio Centennial Exposition," and in pursuance of the order of said Board made May 22, A. D. 1888, the said the Ohio State Board of Agriculture hereby agrees, and promises to pay to the order of Edward K. Stewart, Trustee, the sum of five thousand dollars (\$5,000) at its office in the city of Columbus, Ohio, on the 1st day of January, A. D. 1889, with interest at 6 per cent. per annum, from the 1st day of June, 1888. This bond is one of six (6) bonds of equal amount and like tenor, issued as of equal validity with this bond; the sum of all being thirty thousand dollars (\$30,000), and all being secured by mortgage on all the lands and tenements of said the Ohio State Board of Agriculture in Franklin county, Columbus, Ohio.

In witness whereof, the said the Ohio State Board of Agriculture has hereunto set its signature and seal by John Pow, its President, and Lazarus N. Bonham, its Secretary, on said 22d day of May, A. D. 1888.

THE OHIO STATE BOARD OF AGRICULTURE.

JOHN POW, *President.*

LAZARUS N. BONHAM, *Secretary.*

Architect Terrell appeared before the Board with the plans of the proposed building for the Women's Department, to suggest certain changes in the plan in order to bring the cost of construction within the estimate contemplated by the Board and the Centennial Board. The suggestions were approved by the Board, and the matter of adoption referred to the Centennial Building Committee.

The Secretary reported that in viewing the grounds for the purpose of locating the turn-stile entrance, he found that it would be necessary to enlarge the enclosure between the Treasurer's office and railway gates by moving the Treasurer's office further east.

On motion of Mr. Foster, the matter was referred to the committee appointed at a previous meeting to arrange the turn-stiles.

On motion of Mr. Foster, the Building Committee was authorized to appoint and call to their aid a committee of experts, to examine the north and south annex of the main building on the Fair Grounds, erected under contract two years ago by Mr. W. O. Rowe, and also the Grand Stand and other buildings, and report upon the safety of the same.

On motion, the Board adjourned.

L. N. BONHAM, *Secretary.*

MORTGAGE.

The Trustee, E. K. Stewart, asked to have the mortgage executed May 22, examined by his legal advisers, Watson and Burr. Their examination resulted in a new form, as presented below, and which was duly executed, as will appear in this copy.

WHEREAS, On the 16th day of April, A. D. 1888, the General Assembly of the State of Ohio, enacted a law entitled, "An act to authorize the Ohio State Board of Agriculture to issue bonds for Fair Ground improvement, and to aid the Ohio Centennial Exposition," whereby the Ohio State Board of Agriculture was authorized to issue bonds, not to exceed in the aggregate the sum of fifty thousand dollars (\$50,000), or so much of said sum as it might deem necessary to aid the Ohio Centennial Commissioners in erecting buildings on the State Fair Grounds, and whereby, further, the said the Ohio State Board of Agriculture was authorized, if it deemed it necessary to secure the payment of said bonds and interest by a mortgage of its real estate, with the improvements thereon; and

WHEREAS, The said the Ohio State Board of Agriculture deems it necessary to borrow and issue bonds for the sum of thirty thousand dollars (\$30,000), for the purpose set forth in said act, and to mortgage its real estate hereinafter described, with the improvements thereon, to secure the payment of said bonds; and

WHEREAS, The said the Ohio State Board of Agriculture did direct its President and Secretary to issue its six promissory notes or bonds of five thousand dollars (\$5,000) each, and to execute a mortgage to secure the same to Edward K. Stewart, Trustee, of Columbus, Ohio, by resolutions, which were duly adopted by said the Ohio State Board of Agriculture, at a meeting held by it on the 22d day of May, A. D. 1888, as by reference to the record of said meeting will more fully appear;

Now, therefore know ye, that in pursuance of said law and resolution, and in consideration of the sum of thirty thousand dollars (\$30,000), the Ohio State Board of Agriculture does hereby grant, bargain, sell and convey to the said Edward K. Stewart, Trustee, his successors, heirs and assigns forever, all its real estate, with the improvements thereon, in the county of Franklin and State of Ohio, and in the township of Clinton, known as the State Fair Ground, and more fully described as follows, to-wit: Beginning at a stone at the intersection of the north line of Woodward avenue, and the east line of the right of way of the C. C. C. & I. Railroad; thence N. 3° 20', W. 88.50 poles on the said railroad line of right of way to a stone; thence S. 87° 05', E. 58.68 poles to a stone; thence N. 2° 50', E. 63.68 poles to a stone; thence S. 87° 05', E. 56.12 poles to a stone; thence S. 2° 50', W. 101.56 poles to a stone; thence S. 87° E. 23.52 poles to a stone; thence 2° 15', W. 50.32 poles to a stone in the north line of Woodward avenue, extended; thence with the said line N. 87° 05', W. 129 poles to the beginning, containing ninety and forty-three one-hundredths ($90\frac{43}{100}$) acres of land, situated in the 4th section, township 1, range 18, United States Military Lands, known as Clinton township. To have and to hold said lands and improvements to said Edward K. Stewart, Trustee, his successors, heirs and assigns, forever; provided, however, and these presents are upon this express condition; that

WHEREAS, In pursuance of said enactment and resolution, and with the purposes thereof, the said the Ohio State Board of Agriculture has executed and delivered to said Edward K. Stewart, Trustee, as aforesaid, said six (6) several and uniform promissory bonds or notes, each dated Columbus, Ohio, May 22d, A. D. 1888, each for the sum of five thousand dollars (\$5,000), each payable on the 1st day of January, A. D. 1889, and all bearing interest at the rate of six (6%) per cent. per annum, payable annually, from the 1st day of June, A. D. 1888. Now, if the Ohio State Board of Agriculture, or any one for it, shall pay to said Edward K. Stewart, Trustee, or his assigns, each of said bonds or notes, and the interest thereon, as and when they severally become due, then this conveyance shall be void, otherwise it shall be and remain in full force and effect in law.

In testimony whereof, the said the Ohio State Board of Agriculture hath caused its corporate seal to be hereto affixed, and these presents to be signed by its President, and attested by its Secretary, this second (2d) day of June, in the year of our Lord, one thousand eight hundred and eighty-eight (1888).

Signed, sealed, acknowledged and delivered in our presence:

As to signature of John Pow, President:

THE OHIO STATE BOARD OF AGRICULTURE,

W. W. HOLE.

BY JOHN POW, *its President.*

M. L. HOLE.

Attest:

L. N. BONHAM,

Secretary Ohio State Board of Agriculture.

State of Ohio, Columbiana County, ss.:

Before me, W. W. Hole, a Notary Public, in and for said county, personally appeared the above named John Pow, President of the Ohio State Board of Agriculture, and acknowledged the signing and ensembling, with the corporate seal of said Company of the within conveyance, to be his voluntary and official act and deed, as President of said Company.

In witness whereof, I have hereunto subscribed my name, and affixed my official seal, this 2d day of June, A. D. 1888.

W. W. HOLE, *Notary Public.*

STATE AGRICULTURAL ROOMS,
COLUMBUS, OHIO, *July 12, 1888*—8 P. M.

The Board of Agriculture met pursuant to call. President Pow in the chair.

The minutes of the preceding meeting were read and approved. The Secretary made a statement relative to the condition of the buildings on the Fair Grounds, erected under contract with W. O. Rowe, and presented the following reports of the committee appointed under authority of the Board to examine the same, as to their condition and needs to secure safety:

COLUMBUS, OHIO, *June 13, 1888.*

L. N. Bonham, Esq., Secretary of State Board of Agriculture:

SIR: In accordance with your request we have examined the framework of two of the main buildings on the State Fair Grounds, and respectfully report that, although some of the workmanship was poorly done, especially in the hip trusses at the ends, yet when the slight modifications already begun are completed we believe the buildings will be entirely safe for receiving any number of people who may visit us for the Centennial.

Very respectfully,

S. W. ROBINSON,
J. T. HARRIS,
THOS. F. JONES.

COLUMBUS, OHIO, *June 13, 1888.*

L. N. Bonham, Esq., Secretary of the State Board of Agriculture:

SIR: In relation to the two buildings on the State Fair Grounds examined by us at your request, though we consider them safe for the present season, as stated in a report of even date, yet we believe that for a permanent building that shall be proof against excessive loads of wind and snow, incident to various seasons, the three central hip trusses at each end of the two buildings should each have a bolt to tie the end brace to the upper end of the lower chord, as stated at the time of the examination, and also that there should be substantial trussing put in between all the arched ribs and the rafters extending from the wall to the deck story, to prevent the long time settling or squatting of the top part of the building, and the possibility of future accidents.

Very respectfully,

S. W. ROBINSON,
J. T. HARRIS,
THOS. F. JONES.

On motion of Mr. Foster, it was ordered that the improvements recommended by the above report be made, and that in addition the windows in the annexes to main building be changed to swing on pivots to allow ventilation as needed.

The Secretary was instructed to proceed and have these betterments made before the opening of the Centennial.

The Secretary reported that Architect Terrell had, by his contract, agreed to superintend the erection of buildings for the Centennial, and that he had changed superintendants, and that the present incumbent was not experienced or efficient.

On motion of Mr. Foster, it was ordered that Mr. Terrell be notified that his superintendence of buildings was not satisfactory.

On motion of Gen. Hurst, the former proposition made to the Hydraulic Press Company, of Mt. Gilead, be withdrawn, as the company had failed to comply with the conditions required, and that the executive committee re-arrange with said firm, allowing them space for the proposed building on another location.

On motion, Board adjourned to meet at call of the President.

L. N. BONHAM, *Secretary*.

STATE AGRICULTURAL ROOMS,
COLUMBUS, OHIO, October 19—8 P. M.

State Board of Agriculture met pursuant to call, President Pow in the chair. Present: Messrs. Pow, Hurst, Black, Tryon, Russell, Terrell and Foster.

Minutes of last meeting read and approved. The Secretary stated that the meeting had been called to consider what should be done about Farmers' Institutes the coming winter, and to consult with the Centennial Board concerning the business of the two Boards.

On motion of Mr. Tryon, the Secretary was instructed to arrange for Institutes the coming winter, and to send but one speaker at the expense of the State Board of Agriculture to each Institute, and to meet the expense of the same, the sum of \$1,000 from the fund for the encouragement of agriculture be and hereby is appropriated.

On motion of Mr. Black, it was

Resolved, That the Ohio Centennial Board be respectfully requested to pay to the State Board of Agriculture the further sum of \$7,500, before the payment of any other claims against said Centennial Board, except their running expenses and per cents due Associations; this amount to be credited against the \$14,500 due the State Board of Agriculture for rent of grounds, buildings, etc., as per agreement.

On motion of Gen. Hurst, the Secretary was instructed to call a joint meeting of the State Agricultural and Ohio Centennial Boards for tomorrow evening at 8 o'clock.

The Board adjourned to that date and hour.

JOHN POW, *President*.

L. N. BONHAM, *Secretary*.

STATE AGRICULTURAL ROOMS,

October 19, 1888—7:30 P. M.

The Ohio State Board of Agriculture met. Present: Messrs. Pow, Hurst, Black, Russell and Tryon.

Minutes of last meeting read and approved.

On motion of Gen. Hurst, the following was adopted:

WHEREAS, The Ohio State Board of Agriculture is indebted to Mr. Joseph Hamberger in the sum of five hundred twenty-three and five one-hundredths dollars, (\$523.05) for material furnished, and labor performed in repairing the north and south Annex Buildings on the Ohio State Fair Grounds; and

WHEREAS, There is not sufficient funds in the treasury at this date to pay said indebtedness; therefore,

Resolved, That this Board execute its note for the above sum, payable one year after date, with interest at the rate of six per cent. per annum, in favor of said Joseph Hamberger, and that the President and Secretary of the Board are hereby authorized and directed to sign such note for the Board.

Mr. Russell offered the following:

Resolved, That the resolution adopted last evening by this Board, requesting the Centennial Board to pay over to this Board the sum of seven thousand five hundred dollars (\$7,500), as part of the money due this Board on contract for the rental of State Fair Grounds, for the holding of Ohio's Centennial Exposition, be reconsidered.

After a free discussion a vote was taken, Messrs. Russell and Tryon voting in the affirmative, and Messrs. Black and Hurst in the negative.

The President cast his vote in the affirmative.

Mr. Russell then moved to insert \$13,500 in the resolution of Mr. Black, passed last night, instead of \$7,500, which, on vote, was lost.

The vote then being taken on the original motion, it was sustained.

After approving these minutes the Board adjourned to meet at the call of the President.

L. N. BONHAM, *Secretary*.

JOHN POW, *President*.

STATE AGRICULTURAL ROOMS,

COLUMBUS, OHIO, November 8, 1888—4 P. M.

The Board of Agriculture met pursuant to call. Present: Messrs. Pow, Hurst, Foster, Black and Russell.

Gen. Hurst read the following, which, on his motion, was adopted:

WHEREAS, This Board was authorized by act of the Legislature to bond the State Fair Grounds, and improvements thereon, in the sum of \$50,000, for the erection of buildings for the use of the Ohio Centennial Exposition; and

WHEREAS, The sum of \$30,000 only, of said \$50,000, has been raised on such mortgage security;

Resolved, That to meet the indebtedness of the Centennial Board by reason of advancements for such Centennial buildings, the remaining \$20,000 of said mortgage bonds authorized, but not yet issued, be now issued and placed on sale.

On motion of Mr. Foster, the President and Secretary were authorized and instructed to execute a mortgage for \$20,000 on the State Fair Grounds, to secure bonds to be issued to that amount in accordance with above resolution and the act of the Legislature, and sell the same at not less than par, and transfer the proceeds to the Treasurer of the Ohio Centennial Board.

Board adjourned.

L. N. BONHAM, *Secretary*.

JOHN POW, *President*.

In accordance with instructions of the Board, the President and Secretary prepared and executed such mortgage and bonds in accordance with form and conditions of mortgage executed for \$30,000 of said \$50,000.

STATE AGRICULTURAL ROOMS,

COLUMBUS, OHIO, *January 15, 1889—9 A. M.*

State Board of Agriculture met pursuant to call. Present: Messrs. Pow, Foster, Terrell, Black, Hurst and Brigham.

Reading of minutes postponed until evening session.

On motion of Mr. Foster, the President appointed Messrs. Foster, Black and Terrell, to audit accounts and books for the year 1888.

Adjourned to 8 P. M.

L. N. BONHAM, *Secretary*.

STATE AGRICULTURAL ROOMS,

January 15, 1889—8 P. M.

Board met. Present: Messrs. Pow, Brigham, Russell, Tryon, Terrell and Foster.

Minutes of last meeting read and approved.

Mr. Jamison, of the Bodine Roofing Company, met with the Board, and urged the payment of the balance on their contract for roofing.

The President replied, that the balance had been withheld because the roofs had not been satisfactory, but as there would be changes in the

membership of the Board after the meeting of the Agricultural Convention, it was moved by Mr. Foster, that the present Board refresh their minds by inspection of the roofs, and make some settlement.

The Assistant Secretary then presented the financial statement of the Board for the year 1888, as appears in the journal record of accounts.

After a discussion of the status of the Board and means to meet its liabilities, the Board adjourned until 8:30 A. M., January 16, 1889.

STATE AGRICULTURAL ROOMS,

January 16, 1889—8:30 A. M.

Board met Present: Messrs. Russell, Foster, Bailey, Black, Hurst and Pow.

Minutes of last meeting read and approved, after amending to read as above.

On motion of Mr. Foster, Messrs. Pow, Black, and the Secretary, were appointed a committee to adjust the claim of the Bodine Roofing Company, with power to act.

Adjourned, to meet a half hour before the meeting of the Convention, this afternoon.

L. N. BONHAM, *Secretary.*

January 16, 1889—9:30 P. M.

The Board met as per adjournment, but no business coming before it, adjourned until after the Convention.

Board met. Present: Messrs. Pow, Brigham, Tryon, Russell, Kling, Clark and Hurst. The retiring members met with the Board.

The election of officers for the year 1889, resulted in the choice of

John Pow, of Columbiana county, President.

J. G. Russell, of Morrow county, Treasurer.

L. N. Bonham, Secretary.

Jas. W. Fleming, Assistant Secretary.

On motion of Mr. Tryon, Messrs. Pow, Russell and Kling were made a Committee on Finance.

Adjourned, to meet at 10:30 A. M., January 17, 1889.

L. N. BONHAM, *Secretary.*

STATE AGRICULTURAL ROOMS,

January 17, 1889—10:30 A. M.

Failed to have session because the Centennial Board continued in session until noon.

January 17, 1889—2 P. M.

Board met. Present: Messrs. Pow, Brigham, Miller, Tryon, Clark and Kling.

Minutes read and approved. President Pow reported the result of the committee's conference with Mr. Jamison, Secretary of the Bodine Roofing Company. The company declines to accept the offer of the committee to pay \$500 in full. The Board then agreed to accept Mr. Jamison's proposition to accept two notes, unanimously adopting the following resolution:

Resolved, That the President and Secretary be authorized, and are hereby authorized to prepare and execute the notes of the Board as follows, in favor of the Bodine Roofing Company, of Mansfield, as settlement in full for balance due on roof placed on buildings on State Fair Grounds; First note to date January 18, 1889, payable two years after date, for the sum of \$475, with interest at the rate of six per cent. per annum. Second note to date January 18, 1889, payable three years after date for the sum of \$475, with interest at six per cent per annum; the Bodine Roofing Company entering into an agreement to make repairs on Power Hall roof satisfactory to the Board.

The following is a copy of said agreement:

COLUMBUS, OHIO, *January 17, 1889.*

The Ohio State Board of Agriculture, Columbus, O.:

GENTLEMEN: In view of the settlement made with us, this day, for the balance of our account against your Board, we agree to repair the leakage in the roof on your Power Hall during the summer, preceding your next fair.

Respectfully,

THE BODINE ROOFING COMPANY.

CHAS. B. JAMISON, *Secretary.*

Mr. Stewart met the Boards, and expressed his willingness to take care of the coupons coming in for collection, for the \$2,400 of semi-annual interest on the \$80,000 bonds.

Messrs. Miller and Brigham, having to leave, were excused.

The time of holding the State Fair, 1889, from September 2 to 7, was decided upon.

On motion of Gen. Hurst, the Secretary was authorized to employ an office boy and other clerical help, as the emergencies demand, with a view to economy and efficiency.

The President, on motion of Mr. Kling, appointed Messrs. Tryon and Black, who, with the Finance Committee recently appointed, together

with the President and Treasurer, shall be known as the Executive and Finance Committee.

On motion of Mr. Black, the following was adopted:

Resolved, That the outgoing members of this Board, Messrs. Foster, Bailey, Terrell and Sullivan, carry with them our highest regards as business gentlemen. Genial and courteous in our associations and associated labors during the past years, we part with them with regret in their retirement from the Board, and let them be assured of our warmest sentiments of friendship, and our highest appreciation of their character as gentlemen.

On motion of Mr. Kling, the following was unanimously adopted:

Resolved, That the Ohio State Board of Agriculture earnestly recommend the appointment of Col. J. H. Brigham, its former President, as U. S. Commissioner of Agriculture.

Adjourned, to meet at the call of the Secretary.

L. N. BONHAM, *Secretary*.

STATE AGRICULTURAL ROOMS,

February 13, 1889—7 P. M.

Pursuant to call, the Executive and Finance Committee met. Present: Messrs. Pow, Tryon, Kling, Black and Russell.

Messrs. Chittenden, Sinks and Stewart met with the committee, and after a discussion of the financial condition of the Board of Agriculture, they stated that they, as creditors, would be compelled to foreclose their mortgage to protect themselves. They stated that they disliked to be placed in such a position, and they were compelled to say, that if the interest and the \$50,000 due January 1, 1889, were not arranged for by March 15, 1889, they would have to proceed to collect the same.

The committee adjourned to 8 A. M. to-morrow. In the meantime, Mr. Tryon is to see the House Finance Committee and arrange for meeting to-morrow morning.

L. N. BONHAM, *Secretary*.

2 P. M.

Committee met. Present: Messrs. Pow, Kling, Russell and Black.

On motion of Mr. Kling, Messrs. Kling, Tryon and Bonham were made a Committee on Legislation for the relief of the Ohio State Board of Agriculture, and are hereby instructed to use all diligence to secure legislative aid.

On motion of Mr. Black, it was

Resolved, That Secretary Bonham be instructed to correspond with all persons and corporations who have property located upon the Fair Grounds, or interested therein, and warn them of the jeopardy of same, and invite their personal co-operation with us to bring such influence upon the General Assembly, as to secure the relief from present embarrassment of the State Board.

The Finance and Executive Committee met the House Finance Committee and presented their claims for assistance.

Adjourned.

L. N. BONHAM, *Secretary*.

PROCEEDINGS
OF THE
FORTY-FOURTH ANNUAL SESSION
OF THE
Ohio State Agricultural Convention
HELD IN THE
SENATE CHAMBER, AT THE CITY OF COLUMBUS,
WEDNESDAY, JANUARY 16, 1889.

The Convention was called to order, by the President, John Pow, at 11 o'clock A. M. After the call to order the Convention was opened with prayer by Rev. James Poindexter.

On motion, the Sergeant-at-Arms of the Senate was requested to act as Sergeant-at-Arms for this Convention.

The President announced, that in order to facilitate business it was thought desirable to appoint a committee on Order of Business, as the first thing in order, that they may make their report, and suggested as members of this committee, Mr. Levering, of Knox county; Mr. Baker, Lorain county, and Mr. Charles Ganson, of Champaign. This committee to retire and report on the order of business for the Convention.

The Secretary, L. N. Bonham, then called the roll of counties, and the members came forward and presented their reports. The Secretary reported the following delegates as answering to the call:

Adams, T. W. Ellison; Allen, S. D. Crites; Ashtabula, B. A. French; Athens, J. C. Bower; Auglaize, J. A. Wurst; Belmont, J. B. Hoge; Brown, J. P. Richards; Butler, Peter Murphy; Carroll, Jos. McGregor; Champaign, C. H. Ganson; Clarke, C. Stewart; Clermont, H. Cover; Clinton, Leo Weltz; Columbiana, Ed. A. King; Coshocton, Lewis De Moss; Crawford, C. G. Malie; Cuyahoga, T. W. Scott; Darke, J. Townsend; Delaware, J. H. Warren; Erie, C. H. Rockwell; Fairfield, Thos. Wetzler; Fulton, L. G. Ely

Gallia, C. D. Bailey; Geauga, E. E. Nash; Greene, J. M. Pollock; Guernsey, A. J. Clark; Hamilton, Albert French; Hancock, John Cusick; Hardin, Geo. P. Frame; Harrison, W. W. Jameson; Highland, Isaac Larkin; Hocking, Maynard Pond; Holmes, Jos. Sharp; Huron, E. E. Little; Jefferson, D. P. Sutherland; Knox, J. C. Levering; Lake, E. W. Taylor; Lawrence, J. H. Emmons; Licking, Andrus Beard; Logan, Ezra Brown; Lorain, A. H. Moores; Lucas, S. S. Ketchum; Mahoning, Frank M. Moore; Marion, John McKelvey; Medina, T. G. Briggs; Mercer, H. B. Bennett; Miami, W. I. Tenny; Monroe, J. H. Hamilton; Morgan, J. A. Floyd; Morrow, M. H. Henderson; Muskingum, Hiram Waller; Noble, Wm. S. Spriggs; Ottawa, W. A. Wonnell; Paulding, G. W. Forder; Perry, H. M. Tussing; Pickaway, Mike Morris; Portage, N. S. Olin; Preble, W. H. Snyder; Putnam, John T. Mallahan; Richland, Miller Carter; Ross, Aleck Renick; Sandusky, A. E. Waggoner; Scioto, E. F. Draper; Seneca, John Seitz; Shelby, J. T. Kelsey; Stark, T. C. Putman; Summit, Wm. C. Sackett; Trumbull, S. F. Bartlett; Tuscarawas, B. D. Downey; Union, Gideon Liggett; Van Wert, Geo. Lewis; Vinton, D. Will; Warren, Geo. Carey; Washington, John Strecker; Wayne, A. Cunningham; Williams, Robert Ogle; Wood, Frank Powell; Wyandot, S. H. Hunt.

The President named the following persons as the Committee on Credentials: Peter Murphy, Ed. A. King, and W. W. Jameson.

While the committees were consulting preparatory to reporting to the Convention, the President read his address, as follows:

ADDRESS OF PRESIDENT JOHN POW.

GENTLEMEN OF THE CONVENTION: As presiding member of the Ohio State Board of Agriculture, it is my privilege and pleasure to extend to you a hearty welcome to this, Ohio's forty-fourth annual agricultural convention. At this meeting, you the delegates from the County Agricultural Societies of the State, constitute the Agricultural Board of the State, and the ten men whom you delegated as your executive committee during the past year, make their report for your approval or rejection. We have met here to-day for the purpose of deliberating and giving expression of opinions, concerning topics pertaining to the agricultural interests of the State—one of the greatest of all the interests—and such other matters as pertain to the interests and work of the State Board of Agriculture—and in giving expression to thoughts, on the topics indicated, I desire to be as brief as the importance of the subjects will permit.

The past year, 1888, will ever be a memorable one to the citizens of Ohio, it being the one hundredth anniversary of the first settlement. As early as 1886, some citizens in connection with the members of the State Board of Agriculture, having a great zeal and pride in the wonderful development of the agricultural and industrial interests of the State, petitioned the Legislature for an enabling act, providing for the holding of Ohio's Centennial at Columbus, to exhibit the great growth and improvements made, as shown, when contrasted with the early settlement of the State. The Legislature passed the act, and at once a Centennial Board of Commissioners was formed.

It was a grand enterprise, and one worthy of its projectors, but like all great enterprises, a very large amount of money was necessary for its successful operation, and this the Legislature had failed to appropriate, in any thing like a sufficient amount to meet the necessities of the Centennial Board. In April, 1888, the Legislature partially came to the relief of the Centennial Board, by passing an act, enabling the State Board of Agriculture to bond the State Fair Grounds to the amount of \$50,000.00, to aid the Centennial Board in the construction of buildings necessary for the Centennial Exposition.

The Centennial opened on the fourth of September, with distinguished and appropriate ceremonies, and had apparently, for a time, fair prospects of being financially a success, but owing to a combination of circumstances, which the Centennial Board had

no power to obviate, such as that the railroads throughout the State refused to give regular reduced rates of transit to passengers visiting the Centennial Exposition, together with the continuous rain prevailing during the last twenty days of the exposition, thus preventing the people, to a large extent, from attending. The Centennial closed showing a deficit in receipts, to the amount of about \$40,000, necessary to cover the actual expenditures; which fact reverted very materially against the interests of the State Board of Agriculture, on account of the relations existing between the two Boards in finances.

The Centennial Exposition, while a great benefit undoubtedly to the material interests of the State, has been a disadvantage to the State Board of Agriculture, and one from which it cannot recover unless aid is extended by the State.

The State Board of Agriculture will make no report of the annual exhibition known as the State Fair, for the reason that it was merged with the Centennial Exposition, and was under the management of the Centennial Board.

During this convention, I have no doubt but that General Hurst, the Director General of the Centennial Commission, will present for your consideration a full and complete report of the Centennial Exposition, and I will therefore make no further reference to the subject. Since locating and purchasing the State Fair Grounds, which occurred some five years since, the work of the State Board of Agriculture has been arduous, and attended with many difficulties. Happily, however, the State Fair Grounds are now well improved, and the members of the State Board of Agriculture receive the congratulations of the citizens of the State for having permanently located and improved the grounds, which they ever will ever be the pride of her citizens. The Treasurer's report, which will be submitted to the convention, will give a full and complete account of the receipts and disbursements during the past year. But for the purpose of bringing before the convention a subject I deem of great importance, I will present some statements for your information and consideration. The State Board of Agriculture for the year 1888, started in with an overdraft at bank, to the amount of \$6,968.17, and in order to meet this overdraft, and pay interest on their bonds, and have a little money for other matters, the Board was compelled to borrow \$10,000, which it did by issuing a note, signed by the individual members, and negotiated the loan at seven per cent. interest. (Notwithstanding this fact, and others of a like character which might be cited; indicating the fidelity of the State Board, some of the Press of this city have been unkind enough to imply that the members of the State Board of Agriculture were not trustworthy, and had not the best interests of the agriculturalists of the State at heart.)

The total receipts of the year, including this borrowed money, and the money received from the sale of the bonds issued to aid the Ohio Centennial (heretofore referred to) have been \$85,828.18. The proceeds of the bonds were, as fast as secured, turned over to the Centennial Board, the State Board of Agriculture having no use of it whatever. In the receipts referred to, is also included the State appropriations. The total disbursements for the year, including the \$50,000 turned over to the Centennial Board, have been \$82,628.91. There is shown a balance on hand of \$3,199.27, and this includes all balances in State appropriations, with \$1,397.67 in the hands of the treasurer, and the amount in hands of the treasurer is not sufficient to pay the interest on bonds and notes that became due January 1, 1889—the amount required being \$3,632.90. You will therefore see, gentlemen of the convention, that something will have to be done to at least meet the interest on bonds and notes of the State Board of Agriculture.

Our total liabilities are \$139,793.91, all bearing interest, which is no small amount for the Board to meet, the interest alone being considerably over \$8,000 a year.

The property owned by the State, and known as the State Fair Grounds, including the permanent improvements, cost up to the present time, \$236,602.51, so that if the State were compelled to sell it, at actual cost, to pay the indebtedness, there would be a profit to the State of a little over \$100,000, and I am credibly advised that the land has so increased in value since the purchase, that it alone, without any buildings, would bring in the market nearly as much as the whole liabilities of the Board.

The State Fair Grounds, with all the improvements thereon, is the property of the State of Ohio, and the State should have no reason to regret the action of the State Board of Agriculture in its purchase and improvement, and further, should now aid the Board in its present embarrassed financial condition, to the extent of at least relieving it, by appropriations from the notes and bonds, interest, etc., that become due, and with a small amount to carry on the business, until another Fair can be held.

This property belongs to the State for the encouragement of agriculture, and the industrial interests. The bonded indebtedness against the property draws six per cent., payable semi-annually. The bonded indebtedness of the State pays less than three per cent., and why should not the State, as a question of economy, either pay off the bonded indebtedness held against the State Fair Grounds, by an appropriation, or by funding these bonds with the State bonds, at a low rate of interest. If the Legislature would provide for these bonds, in either way suggested, then the surplus earnings of the State Fair might revert to the State Treasury. I submit this subject for your consideration.

The necessity of some action on the part of the Legislature, to relieve the Agricultural Board from the financial condition that it is in, must be apparent, and I solicit your influence in behalf of the needed aid.

The agricultural industry of the State has not been as prosperous during the past year, and in fact I may say for some years past, as it should have been, to secure a fair compensation for the labor and capital invested. This condition has been attributable to the very low price of farm products, which may be accounted for by various causes, among which would be the constant agitation of the subject of what should be the policy of this country, with reference to maintaining the home markets for the home products; this is particularly applicable to the agriculturist engaged in the breeding of sheep and the growing of wool, but by the results of the recent election that question would seem to be in a fair way for settlement, and I predict for that branch of the agricultural industry of the State an era of reasonable prosperity.

Ohio, together with other central and eastern States, cannot successfully compete under their present system of tillage, with the western States and Territories in their productions. Cheap and fertile lands, together with cheap transportation, places the western States nearer a better market to them than Ohio can hope to have for the same products, as now produced; and the question suggested is, what is to be the remedy for these conditions we are confronted with? My answer would be, better tillage, greater fertility, and a consequent increased production from the acreage tilled.

The farmers of Ohio cannot well afford to grow wheat at the present average yield per acre, and sell it at current prices. But he can well afford to grow thirty bushels per acre, and sell it at the present current price, and be fairly remunerated for the labor and capital, and this I confidently believe can be done on most of the farms of Ohio, with proper tillage and fertility, and the same method will apply to almost every crop grown.

The geographical location of Ohio, with her salubrious and healthful climate, makes her a State well adapted to what is known as special agriculture, and I would cordially recommend to the farmers of the State an investigation of the subject.

The various kinds of stock in the State are in a healthy condition. So far as is known this condition may be accounted for largely by the active part taken by the citizens of this State in connection with the general government, to stamp out all infectious and contagious diseases heretofore existing in several of the States.

The work of the State Board of Agriculture in continuing the crop reports and the holding of Farmers' Institutes throughout the State, meets with general approval on the part of the citizens of the State. Fifty institutes have been provided for during this winter, which was all that could possibly be provided for, with the available means on hands for the purpose. These institutes and crop reports are a great source of information to the agriculturists of the State, and should be extended. The State University, and other institutions of learning in the State, have kindly furnished speakers to assist in holding institutes, and to them the State Board of Agriculture, and those engaged in agriculture, are under obligations.

In closing, I cannot but bear witness to the fidelity of my fellow-members of the State Board of Agriculture, and to the Secretary and Assistant Secretary of said Board, in promoting whatever, in their judgment, would be for the best interest of the agriculture of the State.

The President announced that the next business in order would be the presentation of the Treasurer's report.

The report of J. G. Russell, Treasurer, was then read by Mr. J. W. Fleming, as follows:

ANNUAL STATEMENT

Showing the Financial Transactions of the Ohio State Board of Agriculture for the Year ending December 31, 1888.

The following statement for the year 1888 is compiled from the journal and ledger record of itemized accounts, and is a complete summary of the financial transactions for the year, and the general financial condition of the Board as shown by the books and the vouchers and checks connected therewith.

Expenditures from the several funds have been made only on orders and checks properly signed by the President and Secretary.

Respectfully,

J. H. RUSSELL, *Treasurer.*

RECEIPTS.

Balance from last year in appropriation for encouragement of agriculture	\$770 75
State appropriations for 1888:	
For the encouragement of agriculture	5,730 00
For contingent expenses	800 00
Total	\$7,300 75
From C. C. C. & I. R. R. as payment for 1887, on agreement for location of the State Fair.....	\$2,000 00
From proceeds of the Board's note of January 12, to P. Hayden & Co., signed by the individual members.....	10,000 00
From L. N. Bonham, for fertilizer licenses collected	3,739 20
" rents, team hire, etc.	506 00
" sale of mortgage bonds under the act of March 16, 1888, to aid the Ohio Centennial.....	50,000 00
From Ohio Centennial as part payment on agreement for rent of grounds, buildings, etc.....	10,282 23
From C. C. C. & I. R. R. as payment for 1888, on agreement for location of Ohio State Fair	2,000 00
Showing total receipts from all sources	\$85,828 18

DISBURSEMENTS.

For overdraft on Treasurer at beginning of year.....	\$6,968 17
" old outstanding checks redeemed.....	111 00
" premiums, 1887	159 00
" printing and advertising	84 50
" material and supplies.....	513 20

For lands and improvements	\$486 85
" expense of members	427 45
" office expense	426 28
" postage and telegraph	245 71
" express and freight	90
" Secretary's salary	2,000 00
" Assistant Secretary's salary	1,500 00
" Clerk's salary	750 00
" refunded entrance	23 75
" Institutes and crops	1,773 10
" Superintendent Fair Grounds, salary	90 00
" fertilizer expenses	1,239 28
" interest on bonds	4,800 00
" interest on temporary loans	1,029 72
" note redemption	10,000 00
" Ohio Centennial	50,000 00

Total disbursements \$82,628 91
 Which deducted from the receipts from all sources shows balance on hand \$3,199 27

This balance consists of funds as follows:

In hands of Treasurer	\$1,397 67
State appropriation for encouragement of agriculture	1,283 65
State appropriation for contingent expenses	517 95
	<hr/>
	\$3,199 27

LIABILITIES.

For outstanding check of former years	\$312 45
" outstanding notes and certificates	5,848 61
" regular bonds of the Board	80,000 00
" short time bonds of the Board issued to aid the Ohio Centennial	50,000 00
" interest on bonds, notes, etc., to January 1, 1889	3,632 90

Total liabilities.....\$139,793 96
 From the liabilities as stated if cash on hand in all funds be deducted, there remain as actual liabilities over and above all funds\$136,594 69
 Cost value of State Fair Grounds, buildings, and improvements thereon, figured at close of last year\$201,015 66
 Improvements during 1888 by the Board..... 486 85

Total	\$201,502 51
Estimated cost of permanent buildings and improvements placed on the grounds by the Centennial Board:	
Woman's building.....	12,000 00
Art gallery	7,000 00
Cattle amphitheater	3,000 00
Machinery department.....	7,500 00
Express buildings, booths, etc.	2,300 00
Live stock headquarters	500 00
Gas machinery and pipes	1,500 00
Grand stand seats, etc	300 00
Roadways and water pipes	1,000 00

Total.....\$236,602 51

Showing the cost value of grounds, buildings and improvements over and above actual liabilities to be\$100,007 82

To which may be added at least \$35,000.00 as representing, at a low estimate, the increase in value of land since the purchase in 1883 and 1884.

REPORT OF THE AUDITING COMMITTEE—1888,

For the Financial Accounts of the Ohio State Board of Agriculture.

We, the undersigned committee, appointed to examine and audit the financial accounts of the Board, respectfully report that we have performed that duty by a careful examination of the journal and ledger record of itemized accounts, and a comparison of all checks and orders issued and redeemed, with the vouchers connected therewith.

The books have been correctly kept, and all expenditures have been made in accordance with the authority and approval of the Board, by orders on the Treasurer and appropriations properly signed by the President and Secretary.

The annual statement presents a complete and correct summarized showing of the financial transactions for the year, and the general financial condition of the Board, the receipts, disbursements and liabilities being properly set forth.

We find that of the \$139,793.96 of liabilities that the sum of \$59,793.96 is mostly past due, the balance of the total liabilities being the regular long time bonded indebtedness of \$80,000.00.

To pay the present pressing liabilities there is in the hands of the Treasurer, the sum of \$1,397.67, the small balance of funds on hand above this being in State appropriations which cannot be expended except for the purposes for which appropriated.

The principal part of the present pressing liabilities was incurred to aid the Ohio Centennial, and is a mortgage lien upon the Ohio State Fair grounds, and it is evident to your committee that the Board must receive immediate relief in order to protect its valuable property, the property of the State.

Respectfully,

WM. S. FOSTER,
J. M. BLACK,
JAMES H. TERRELL.

The President announced that the next thing in order before the Convention would be the report of the committee on Order of Business, and Mr. Levering submitted the report of the committee as follows:

The committee on Rules and Order of Business would make the following report:

First—Calling the roll of counties.

President's address.

Secretary and Treasurer's reports.

Nomination of candidates to fill vacancies on State Board.

Recess.

AFTERNOON SESSION—2 O'CLOCK P. M.

Reports of Committees.

Address of President Warfield.

Discussion on resolutions opened by W. B. McClung.

Miscellaneous discussions.

Recess.

EVENING SESSION—7 O'CLOCK P. M.

Election of officers.
Miscellaneous business.

Respectfully submitted.

JOHN C. LEVERING,
R. BAKER,
C. H. GANSON.

On motion, the report was received and adopted as the Order of Business for the Convention.

The President: I find there is one committee not provided for, a committee on Resolutions, and with your permission I will suggest the names of the following gentlemen as members of this committee: W. B. McClung, Franklin county; L. G. Ely, Fulton county; John Seitz, Seneca county. This committee can hold a conference and report this afternoon.

Peter Murphy: I see by the Order of Business just adopted that nominations of candidates for the State Board of Agriculture is next in order.

The President: Gentlemen of the Convention, it will be in order now to receive nominations to fill vacancies caused by the expiration of the terms of five members of the State Board of Agriculture. I will announce to the Convention the names of the gentlemen whose term of office expires: W. S. Foster, C. D. Bailey, J. G. Russell, J. H. Terrell, and J. J. Sullivan.

Mr. Levering: Allow me to present the name of A. Cunningham, of Wayne county, as a suitable man to represent that county in the State Board of Agriculture.

A Member: I will present the name of J. G. Russell for re-election.

Mr. Poorman: I desire, in the name of Belmont county, to present a candidate for this position. Belmont is one of the largest agricultural counties in the State, and it has not for twenty years had a representation on the State Board of Agriculture. We are surrounded by an agricultural country, and we desire that our county shall be recognized by this Board, and I give the name of J. B. Hoge, and ask this Convention to consider the claims of this county.

A Member: Allen county desires the name of W. E. Watkins presented to this Convention for consideration, and I wish to say that Allen county has never had a representation in this State Board of Agriculture.

Peter Murphy: I desire to present to this Convention the name of Amos Kling, of Marion county. I am not familiar with the gentleman, but from his appearance and the information that I have received I believe he is a very elegant gentleman, and I am satisfied he will be the right man in the right place. I believe this Convention cannot do better than to elect Mr. Kling,

A Member: I desire to present the name of a man I know from Erie county; he is a worthy farmer, and his name is W. W. Miller.

Mr. Draper: I represent Scioto county, one of the extreme border counties on the south. Members of this Convention who were here last year will remember that we had a candidate at that time, and he received nearly a majority of votes, but did not receive a majority. We want him this time to receive a majority; and if there is such a thing as a claim on the Convention, we think we have one or two points that I may advance as claims.

First. The location in the State which we represent geographically; if you draw a line through the State from east to west the southern half of the State has but one or two representatives. It may be true that the southern part of the State is not as large an agricultural section as the northern part, but two members out of ten is not sufficient, we believe. The southern part of the State has been regarded as a mineral region, but latterly our farmers have been improving their land, and have been giving a greater amount of attention to their farms than formerly, and the stock raising business has increased wonderfully; farmers are fertilizing their lands, etc.; it is useless to say anything about the fertility of our bottom lands; that is well known. But we wish to receive the encouragement of this State Board of Agriculture, and I announce the name of H. S. Grimes. He is President of our Association; is below medium height; about 35 or 40 years of age; he has no superior to work in our State, and I can assure you, gentlemen, that he will bring to this place a sufficient amount of energy; he is a young man made that way—he is made entirely of vigor and energy; he is willing to spend his time freely and his money, and I hope the Convention may receive the nomination with favor. As I said before, his name was before the Convention last year, and nearly received a majority.

A Member: I desire to present the name of Mr. J. F. Neisz, of Stark county, as a candidate.

Mr. Lyon: Ohio has within her borders a great many congregations of men formed for different purposes; in fact, in every portion of our country Ohio seems to be in the front, and everywhere the progression of her sons and daughters is abroad in the land, and the whole people have been reaping the benefit of the wisdom and the patriotism, and the intelligence that is within the borders of our State, and nowhere is there gathered to-day, or any other day, in all this State of ours, a steadier class of men doing more work than the men gathered here to-day, representing the agricultural interests of our State. Rejoicing in the fact that from our counties men full of intelligence, full of patriotism and full of love for the

interests that make our State great, and because of this fact I, at the request of friends, place a name in the list of candidates for nomination as a member of this State Board of Agriculture, and I am not surprised at men wanting this position, for it is one of the most honorable within the gift of a society which is doing so much for the up-building of the agricultural interests of our State. Back in the dark ages of the war when men's souls were tried to their very depths, I met this man down in the prisons of the South; he is an old friend, and for months we joined hands there. I knew him when he was lean, lank and lousy, and I have known him all the years since as an honest citizen and a faithful worker in the interests of agricultural advancement, to the best of his ability, and in the interests of our State. I have known him as an intelligent gentleman, working with intelligence at the problems set before farmers in this State, and I know him as one of the ablest of men, and I herewith present the name of J. B. Pumphrey, of Hardin county.

A Member: Mr. President, I desire to announce a candidate, but I will give you his name first, for fear I forget it; it is Alexander J. Clark, of Cambridge, in Guernsey county. If we have any claims to present, it is in the fact that when we have a member in the State Board of Agriculture we have rendered you good and faithful service. I feel a little embarrassed before this Convention. I have been in a good many conventions in my time, but I have never before been in an Ohio State Convention of Agriculture. I have been in schoolmaster's conventions, and in political conventions, and in some Grand Army conventions, but it seems to me that I see about the same fellows here that I have seen everywhere else, and if they don't live by the sweat of their own faces they live by the sweat of somebody else's face. To return to Clark, he is a farmer of Guernsey county, and a fairly good-looking man; he looks well in the muster; he is interested in his business; he is a good farmer and a good stock breeder, and he has not got many irons in the fire. Now, I think it would be well to elect Mr. Clark a member of this State Board of Agriculture, not particularly because he is a Guernsey county man, but because he is an Ohio man, and he has the ability to extend his usefulness throughout this great State in your Board.

Mr. Waller: After so much eloquence from the other members of this Convention, I feel rather diffident in addressing you, but Muskingum county presents the name of Mr. Benjamin F. Swingle as a candidate for this position. He is an intelligent, progressive farmer in all that the words intelligent and progressive mean; he is a man of ability and a man of brains, having means and leisure, together with the possession of perseverance, and he will bring to this council wisdom and common sense.

It is a long time since Muskingum county has had a representative in the State Board of Agriculture, and she feels that her voice should again be heard in its counsels. I trust you will not forget Muskingum's claims in casting your votes.

The President: Are there any more nominations?

Mr. Murphy: Mr. President, if it is not too late, I would like to add another name to the list, that of J. W. Edwards, of Warren county, who is well known to the members of this Board.

The President: The Secretary will read the list of candidates.

The Secretary read as follows: A. Cunningham, Wayne county; J. G. Russell, Morrow county; J. B. Hoge, Belmont county; W. E. Watkins, Allen county; A. H. Kling, Marion county; W. W. Miller, Erie county; H. S. Grimes, Scioto county; J. F. Neisz, Stark county; J. B. Pumphrey, Hardin county; Alexander J. Clark, Guernsey county; Benjamin F. Swingle, Muskingum county; J. W. Edwards, Warren county.

The President: Those who may have resolutions which they desire to submit will give them to the Secretary, who will present them to the Committee on Resolutions

Recess until 2 o'clock P. M.

AFTERNOON SESSION.

The Convention was called to order at 2 o'clock P. M., by the President, who announced that the first thing in order would be the address of President E. D. Warfield, of Miami University.

THE FUTURE OUTLOOK FOR AGRICULTURE IN OHIO.

MR. PRESIDENT, AND GENTLEMEN OF THE CONVENTION: The subject which I have chosen to speak to you on this afternoon, is the agricultural outlook. I am aware that there is a feeling throughout the country, and especially in the State of Ohio, that the agricultural outlook is exceedingly discouraging. I am aware that this feeling has been growing in intensity for a number of years, and that the tendency of nearly all speakers at Farmers' Institutes and other conventions, has been to increase this feeling, and too much has been said in the way of showing what makes against the farmer, and too little has been said in regard to those things which hold out encouragement for the future, or which tend to show that the farmers as a class—that agriculture as a calling—is proceeding in a due ratio with the progress that the country at large is making. And I wish to speak to you this afternoon chiefly upon this line; to point out to you some of those things which make for agriculture in this country, and to show you that the skies are not as dark as they seem to be; and as to a gathering gloom settling down on this country of ours, I will say that the prospect for the future is eminently encouraging, and I do not think that I over-state the case. Indeed it will be my purpose to weigh with great care everything I say upon this subject, and to utter no words which will not be based upon facts—real facts—and it is eminently proper for us to pause and look at them.

That there has been a depression for a number of years, in agricultural circles at least, is true, but this depression is not confined to the walks of agriculture. Generally it is due to natural causes increased by artificial causes. It extends, not only through this country, but the same depression has spread throughout the world. There is not a single country in all the bounds of civilization that has not felt the depression both in agricultural, financial and general mercantile circles, but I believe that the tendency at the present time is toward better times, and I believe that the agricultural population is likely to take the lead in it.

After all, on what does agricultural prosperity depend? The agricultural population everywhere is certainly the most honest, thrifty and self-dependent; there is no other element of the population which possesses these three qualities which go to make up the bone and sinew of the country, so entirely, or to so high a degree as the agricultural population. This is true in an eminent degree of the agricultural population of this country; there is no population so self-dependent. In Great Britain the tenant-farmer is the rule and not the exception; the land holders are few, and their lands are leased out to actual farmers at a rate so high that any real gain to those farmers is a matter of great doubt, and at each year's end it is with the greatest difficulty that the farmers, as a class, are able to make the two ends meet; and of all the countries of Europe, the farmers of Great Britain are in the best condition. The French peasant farmer has never rallied from the results of the various revolutions which have wasted that unfortunate country, and if it were not for some special employments, such as the grape culture and the olive culture, and similar occupations, the condition of the French peasant farmer would be the most deplorable in the world. The condition in Germany is scarcely better. The agricultural population of that country has been rapidly pouring into the cities or to this country—to this better land. But the thrifty American farmer owns, in the main, all the land he cultivates; owns all the property necessary to cultivate that land; rears his family, and rears them according to the high standard of morality which the agricultural population of this country holds up to the world; we demand something more than is demanded by the agricultural population of other countries—a progressive people who want something more than the means of supporting life, and making off their farms a bare subsistence; with that, other countries are contented but we want to make something adequate to the demands of advancing civilization; something to encourage and to arouse the children on the farm. We do not want merely to live—we desire to give the best educational advantages to our children. Our farmers send a larger proportion of their sons to our institutions of learning than any other class of the community, and they must continue to do so. The farmer means to lay up a little; he wishes to lay by something against that rainy day that we hear so much about; that possible contingency when his powers may fail; against the necessities of old age. And no American farmer is willing to send his children out upon the world without some money to support them during the days of their apprenticeship; something as a nest-egg for their beginning in life. The farmers of the old world were content to see their sons plod along in the same weary line that they had walked in—no change from generation to generation. But the American farmer has demanded and is still demanding that his son shall begin where he left off, and not where he began. And it is, therefore, when the farmer sees the difficulty of doing this, that he feels that the day is dark and that the sky is growing more and more gloomy above his head.

What, then, are the means whereby we can practically improve these things? Are we to seek this improvement in bettering our markets? Are we to seek it by special legislation which will procure some decided means whereby prices shall either be raised or maintained at the level of war prices? Or is the farmer to seek at home some method of increasing his production—some method of raising, at less expense, the products which shall bring in, if not the same sum of money, what shall represent the same value. We must remember that there are very different ways of estimating values; that a dollar

to-day, and a dollar ten years ago, and a dollar ten years hence may represent very different values. Money is simply the medium of exchange; it does not constitute wealth. Wealth is the great sum total of all the property the country possesses—anything which is used and which is able to be appropriated to our various necessities—if the standard of value maintains a constant ratio, then a dollar is of the same value; but if at the close of the war, gold was worth \$2.40, and if to-day gold is worth par, our dollar represents actually to us a great deal more in the markets of the world than it did at that time. Therefore we must not be led away by any delusive idea that if there is a decline in the market for wheat, it is worth less to-day than at the close of the war, and that necessarily the farmer is that much worse off, for not only have all the products fallen proportionately, but the actual purchasing power of a dollar to-day has risen even in the same proportion, consequently for all the products together there is no loss. One of the great difficulties we have had to contend with is that many agricultural products really were the first to fall after the war—a great many soldiers returning from the war and finding their occupation at a standstill, branched out into the west and went into agricultural pursuits—the new lands of the west were rapidly occupied, and immense crops of wheat and corn were put upon the market, and this was the first surplus after the war. Consequently the first fall in prices came upon the agricultural population. But this shows that there has been a steady tendency, owing to over-production in other departments as well, to bring these values to a proportionate ratio. As a result of over-production, our wheat crop which was too great for home consumption, was met in the market by wheat from the fertile wheat fields of Russia and other countries, and we find the wheat crop pressed down to practically compete with it on the market at no profit. What we need is to have other departments of labor so encouraged and so developed that they shall be made to balance. If statistics are to be trusted, this tendency to leave one department of labor which has been over-filled with surplus—this tendency to balance one department of labor with another—has been unceasingly driving toward an equilibrium, and the last year shows more inclination to balance than any year in the last ten. The agricultural prices are going to be the last to feel this balance, and the agriculturists have become so discouraged that they are unwilling to wait. There is a panicky condition throughout all our agricultural circles, which has given farmers want of confidence, not only in the markets or the world but in themselves. This is well illustrated in the condition of the markets of live stock. The farmers of Ohio and Illinois and Indiana, have come to lose confidence in the live stock markets in a remarkable degree. The farmers of some other States are more conservative, and other markets are able to maintain a better ratio in consequence of this confidence. Twenty years ago the farmers of Ohio and Kentucky were almost an exclusive power in supplying the meat markets of the world with the highest class of beef. Ohio has fallen remarkably behind, not so much in the production as in the quality; they have not maintained the same confidence that Kentucky boasts of, feeding the best quality of beeves, and furnishing the best quality of beef. The farmer who has the best Kentucky cattle has been able to maintain the very highest position, not only in the markets of the large cities, but in the export trade. Illinois comes next, but Ohio has fallen behind more than there was any reason to believe that it would. This seems to me to show that we want more confidence, more consistency of purpose, in order that we may maintain one standard when we have adopted it. I believe the fundamental principles of success are, first, an eminent desire not only to raise the very best, but to raise it in the very cheapest manner. The policy which Great Britain adopted and carried out for several hundred years prior to the last century—a policy largely inaugurated by the great ecclesiastical establishments which, up to the time of the Tudors, maintained a high place in agricultural affairs—was to take the best they could get and use it without any definite aim at improvement. The result was that when the great improvers of the last century appeared upon the scene, they found that agriculture had made no improvement in two or three hundred years; they had the same kind of wheat; they had the same kind of cattle and horses from generation to genera-

tion. A careful record kept in those old abbeys for six centuries showed very little improvement in the cattle of Great Britain, or of any live stock. There suddenly came a great depression—so great that the agricultural laborer was starving—the tenant on the farm could no longer make a living, and there came a growing tendency to emigrate from the farms to the cities. This depression affected not only agricultural interests, but mercantile and manufacturing pursuits as well. And here we find an example of the survival of the fittest; the more intelligent of the farmers were not inclined to give up what their fathers had practiced, but to aim to make each piece of land raise more grain than ever before, by some method of cultivation, and in this way to better the condition of the farmer. Not by extending his land—not by undertaking to farm more land than it was possible to take care of—a prevalent danger at that time in England—but to make each acre profitable; to improve each animal—so as to bring to bear upon this problem, not the old policy of doing things just as their fathers had done before them—holding to every tradition, good or bad—but to bring to bear upon it every scientific means of aid which they were able to secure. A number of experimental farmers and experimental scientists worked together, and as a result there was scarcely a product which was used on the farm, which in a period of about fifty years was not improved to such an extent that it was hardly possible to believe the improved variety was obtained from the old unimproved variety which had satisfied generations of farmers.

Then appeared on the scene such men as Robert Baker, in cattle and sheep interests, and Robert and Charles Collier, and other men, who saw how good some of the products of the farm were, and saw also how much better they could be made. They were wise; they did not give way to discouragement and say that the markets were against them, but they worked on and were carried on the crest of a great wave until they got almost, if not altogether, the highest prices. Products were needed in the war, and on the crest of this wave in 1810, the whole agricultural world went crazy with speculation. The great sale of Charles Collier, of cattle, is a fine example of this speculative tendency; animals that had never known what it was to bring more than two hundred dollars, brought at that sale as much as five thousand dollars. This speculative tendency swept on, and everybody went into speculation. The war closed and war prices ended, and there came a great depression such as we are suffering from at this time. From that time until 1850 there was a slow but steady decline in agricultural interests. All those who had been drawn into it through speculation, got out of it or dropped behind; those who were fitted to it either by a catholic love for it, or by eminent fitness, remained, and they continued the work of improvement steadily and surely. But this could not go on forever, speculation again appeared, as most of us know. We know that in every department of agriculture, before the war, there appeared a similar tendency to speculation, yet not until 1878 was the climax reached, when the enormous sum of \$40,000 was paid for a single cow. You all know what has been the recent state of the trotting horse market and the running horse market—those peculiar classes. Now all of these things necessarily affect every farmer; speculation is followed necessarily by a decline in prices—these speculative tendencies are necessarily prominent when they exist—and men are drawn on and on unthinking, but when they reach one of these periods of absolute depression, then they stop to think how they can give up their business and find some other, more lucrative. One of the principles of nature and business is that when we have one of these large speculative, money-making movements, when speculation reaches these phenomenally high rates, depression must necessarily follow; and it is also true that after one of these great depressions that there is a gradual return to honest, persistent, steady hard work, which results in a steady rise in prices. The rise in 1810 lasted until 1850. Now I regard it as true, from a careful study of the prices of agricultural products for two or three generations, that, as Mr. Rogers has shown in his *Six Centuries of Work and Wages*, through the six centuries fancy rates were always followed by extreme depression, and then there was a regain of prices. I regard the last ten years of hardship a promise of a return to more systematic business habits throughout the

country; to more careful habits in the farmer; less fluctuation of purpose and more definite attention to the ends of farming.

The promise of the outlook is to the laborer of any sort—whether the farmer who simply crops the farm, or the general farmer who raises both cattle and crops, or the large breeder of any particular kind of live stock, and I think there is a general tendency to return to more natural methods of labor and steady return to higher prices—not to fancy prices, such as we had ten to fifteen years ago, and I do not think the thorough going farmer desires a return to this speculative market—I do not believe that any of us who have lived through one, desires to again go through its harrassing conditions, having set before our eyes the certainty that the crash must come.

What the farmer wants and needs is that year after year will yield him a fair profit and a full return—that he will not be robbed of his profits. He wants to understand the conditions of trade; he wants to understand that for a certain crop supply there will be a certain demand, and that supply and demand will eventually balance the price of the product. When the farmer wakens up to these conditions of trade, he will be able to bring to bear upon speculation an influence that will be felt—that kind of pressure that will not represent merely blind opposition, but cool, calm calculation on the condition of affairs, and which will point out to every intelligent legislator the intention of the farmer to put down all dishonest measures—to put down all manipulation of the market—while he does not desire to interfere with any legitimate business of any kind. The farmer expects increased business through mercantile prosperity—through increased consumption—and the whole country is brought into a state of equilibrium, into a state of production. This demand for some of the products of the farm would keep the farmer necessarily thrifty, and then could we expect from home consumption of beeves and wheat and corn, that return which is all the farmer wants or demands. When the farmer turns to improve the conditions on the farm he is confronted with the proposed surplus. Why then seek to produce more on the land—over-production only increases the poverty of the farm. That is a very difficult problem to settle, and the farmer in approaching it from any single point of view, sees the condition of affairs from that point, but he will almost necessarily be blind to the other side of the question; but over-production, if caused by waste, is a most expensive thing to be indulged in. If the same amount of production can from the same amount of land be set over against an increased production raised from the same land, not taking any more labor, we have economy of production.

It is sometimes hard to account for a rise in prices, but the true way to account for it is that every department of labor is co-operative, and if farm products are lowered to a very great extent, that consumption is increased in every other department of labor with the demand and where the best products of the farm are brought down by careful saving in production, that by some operation on the part of the laboring classes there is an increased demand for it—the demand increases, and consequently the surplus is steadily decreased. This question of political economy is one of the most difficult to make clear, but it is one of the fundamental principles not sufficiently ascertained, and yet these facts are plain to any one who will investigate them. And yet our dogmatical economists mislead farmers by laying down hard and fast rules which cannot be made to fit into practical affairs. What the farmer seems to want is to develop every department of labor to its utmost. Now, so long as high grade cows can be bought at two and a half cents per pound, let the scrub go, and take the chance of these prices to put better cattle on your farms. The very best breed of thorough-bred cattle can be had now at the same price as the scrub, and these prices should be taken advantage of by our farmers. Then increase the productiveness of your land; by experiments find out which are the best fertilizers to use—this is a step in the right direction. But I have known men—have talked with some this week—who use high priced fertilizers which add nothing to the land; they have simply bought a commercial fertilizer—not knowing what the land needed, but have bought it simply because some other man had used it with success. Now, what we want is increased intelligence in all the details of farming.

We do not want to buy grade cattle when we can buy thorough-bred at the same price. If we can buy thorough-bred breeds at grade prices, which will give us milk and cream and butter, and calves which will go to market at high prices, while the scrub will make no return either in beef or milk, we will save an immense percentage in the outlay. Use only those fertilizers, and other similar implements for improvement, after having tested their qualities fully, and run no risk of throwing your hard earned money away, and we will in this way get some actual return for every bit of outlay. Wastefulness has been the curse of the American farmer. Some parts of this State have been farmed better than others, yet no man can ride on the railroad through Ohio and not see reapers and mowers and plows laying in this winter weather out in the fence corners. How can you expect a return for your labor when you waste things which were paid for by the sweat of your brow? We have got to curtail expenses in order to bring in the profit which is our interest, and if we are going to waste things for which we pay money, in that way, the outlook is deplorable. We want thrift everywhere, and saving in the simplest details. Let our methods show we are abreast of the world, not merely in applying those principles which will make production as much as possible, but consumption as small as possible. Therefore it seems to me that we should hold fast those methods which are good, and adopt the most saving methods in other departments; adopt the most economic methods—the methods most free from waste—and insure the using up of every element, of every part, of every kind of expenditure which we put upon our farms. We do not want to buy products for use of which we only use fifty per cent., but we want to use one hundred per cent. of every article brought on the farm to increase production. It is from such sources that the economical British farmer is able to make a living out of his farm. It seemed wonderful to me to hear them say that they did not expect to make any money out of steers, only in the manure, and that paid them for doing it; they stored the manure and kept every ingredient which would be available to the land, and out of the manure they reaped a profit for fattening steers and made money. Is there any American farmer who would fatten steers if he could not make more money than that out of it? Our corn can be made to go to market in steers at from 75 to 80 cents—that is done by saving—people scoff at baby beef, but there is money in it, if the farmer will feed them the corn at such times that they will not lose it in their growth, giving them such shelter that they will not lose a pound from any blizzards that may sweep down on us—if he will not let the cold take the corn out of the hides of the cattle after it is put in.

Not by going to expensive methods of doing, but by saving wherever these means can be employed, is the farmer's outlook good. I have seen profitable and unprofitable farms lie side by side; I have heard one man say there was no hope in agriculture, while the man beside him was successful in the highest degree.

We find now, when we are complaining of depression, that the farmer really enjoys more solid independence in this world than exists in any other department of life—more thrifty, frugal, honest contentment—and he is doing more to advance the cause of right in this country, but he needs to see these other things and hanker after them; there is no other royal road to fortune; and if there is any way to reach it I believe it is in these particular habits and characteristics of the farmer of the present day. Not only so, but the tendency of the day gives promise of a more equally balanced condition of supply and demand, and on that do I particularly base my hopes for a better condition of affairs in agricultural circles for the next few years.

The President: The report of the Committee on Resolutions is now in order.

Mr. McClung: The Committee on Resolutions have agreed on the following, and respectfully submit them, recommending their adoption.

Mr. Sites moved that the resolutions be considered separately, which

motion prevailed, and the Secretary read the resolutions in order, as follows:

RESOLUTION No. 1.

WHEREAS, The State Board of Agriculture represents the agricultural and mechanical interests of the State, and has secured a permanent location and improved it suitably for industrial exhibits, which tend to advance the general interests of the State; and

WHEREAS, The purchase of State Fair grounds, and the improvement of the same, necessitated the bonding of the property in the sum of \$80,000, bearing six (6) per cent. interest there; on and

WHEREAS, The Board of Agriculture had further liabilities for which their individual obligations had been given, to meet the necessities of the business of the Board; and

WHEREAS, The General Assembly authorized the holding of the Centennial exhibition on the State Fair grounds in the fall of 1888, thereby preventing the usual revenue arising from the State Fair; and

WHEREAS, The Centennial Board, on taking possession of the State Fair grounds for holding the Exposition, agreed to pay the Board of Agriculture a sum sufficient to meet interest, insurance and maturing notes, and failed to pay more than fifty (50) per cent. of this amount; and

WHEREAS, The General Assembly authorized the Board of Agriculture to bond the State Fair grounds further in the sum of \$50,000 for buildings and improvements for use of the Ohio Centennial Exposition; and

WHEREAS, The Exposition, through a combination of adverse circumstances, failed to realize enough to meet these \$50,000 bonds and the other obligations to the State Board of Agriculture, thus adding to the indebtedness of the State Board so as to hopelessly involve it; therefore,

Resolved, That it is the sense of this Convention of representatives of the agricultural and other industrial interests of the State, that the best interests of agricultural and mechanic arts demand that the General Assembly make provision to meet the immediate necessities of the State Board of Agriculture, and enable the Board to preserve to the State its valuable grounds and buildings, and continue annual exhibits of the industrial products of the people.

Mr. McClung: Gentlemen of the Convention, having been pressed into service as one of the Committee on Resolutions, although quite foreign to where I should have been, being a citizen of Dakota, some twelve hundred miles away from here, yet I have an interest in it. I came here to attend the annual convention some thirty years ago, but there are very few here to-day that were here then, and the agricultural and mechanical interests of the State were certainly very limited then. I can remember the first convention I ever attended. Mr. Sullivant exhibited a thoroughbred bull out on the streets, which caused great interest. And I remember at our fairs as the machines came on exhibition; the first McCormick machine, then the different improvements, one after another, and as they came on the platform, right beside them stood a little model which would displace them the next year, and another little model would come on, and the next year it would give place to another, and so the improvements

have gone on from year to year, for thirty-one years, and to-day it is what it is.

Excuse me if I do speak in favor of this great interest to-day, although not a citizen of Columbus now; I want to say this, as far as Ohio is concerned it is hardly necessary to actually be a citizen of Ohio, for Ohio men are everywhere, and her interests are everywhere, and her representatives are everywhere.

Now your committee, in making this report, simply took the facts as they found them. They found that your State Board of Agriculture reported your fair grounds as being in jeopardy, but by no action of your Board. There has been one grand march of progress, as far as the Board is concerned, until to-day brings this up to the front as a great State of the Union in all the industrial interests of the country. It is to your interest; it is to the interest of the General Assembly; it is to the interest of the people that this great institution should be protected and taken care of. It does not belong to the State Board of Agriculture; it does not belong to any particular interest in Ohio, but it belongs to the State of Ohio, and because Ohio owns it, and because the central interest of all the agricultural and mechanical, and of course the educational interests should have a chance to make their annual exhibit in the State of Ohio.

Then, gentlemen, as we have reported the facts, I think it is not necessary to go into details. The elements combined against the State Board of Agriculture and the Centennial Board, and when that combination was against them they could not succeed. It is generally understood that whenever a rainy season occurs, a fair is a failure, as far as financial success is concerned. Then what should be done? The General Assembly ought to follow in the direction pointed out; they ought to take hold of their own interests and put it upon its feet, with a certainty that with fair weather and the energy of its people, it will go on to triumphal success. Ohio stands in the lead in agriculture, in the mechanical arts and in everything, and her fair name should not be trailed in the dust because of the neglect of the General Assembly to take care of her grounds. Since this Board purchased the ground, it has become an investment to-day of immense interest to the State of Ohio, and of great value, and that the State of Ohio can afford to take care of and to hand down to posterity.

Mr. Pollock: I would like to ask if this resolution contemplates the payment of the debt of the Centennial Board — that is, any part of it that the State Board of Agriculture has not already assumed.

The President: This resolution is simply to cover, to a large extent, the indebtedness of the State Board of Agriculture, incurred by reason of the Centennial.

Mr. Pollock: I am not sure that I understand it yet. As I understand, it only proposes to provide for such an amount of debt as was incurred by the Centennial Exposition as the State Board has already assumed. Now, if I am correct, I think that there is a debt that the Centennial Board has not paid, and that the State Board of Agriculture has not assumed. Some of the exhibitors at the Ohio Centennial have received 45 per cent., some 55 per cent., and some 100 per cent. of their premiums; now, suppose we pass this resolution, what will be the result?

Mr. McClung: As I understand the resolutions, they make no effort or no recommendation to look after any other interest than they, as the State Board, are responsible for. If the Centennial interests have suffered, that is another question to come before the Convention. The proper way is by a resolution stating the fact coming before them, that they could act intelligently. I take it that the direct interest at issue is the interest of the State Board of Agriculture and the grounds. Now, when we decide on that, I am perfectly willing to take up the other question.

Mr. Pollock: I thank the gentleman for his explanation, but it is nothing new when I once learned that they did not intend to provide for this debt, and I want to raise the question, is not the interest of the State Board of Agriculture at stake—does it not reflect against the State Board, and will it not injure our exhibitions here in the future, if this debt is not paid?

A Member: I should like to ask the gentleman a question for information. Does he know the deficiency of the Centennial Commission?

Mr. Pollock: I do not.

A Member: We have had no information, and could not, therefore, act in the matter.

Mr. Sites: The committee did not deem it necessary to consider anything about the management of this Centennial Board; what this resolution proposes is a matter in which the Legislature, as representatives of the entire State, has a direct financial interest, and it is not necessary, in discussing this resolution, or in considering any statement of facts that form this preamble, to consider the management of the Centennial Board, but to consider what the Legislature has already done in authorizing the Centennial Exposition, and the action of the State Board of Agriculture, in yielding this year to the Centennial Board, instead of holding its annual fair, as heretofore. I do not propose, Mr. Chairman, to defend or condemn the action of either of these Boards, nor of the Legislature, in providing for the Centennial Exposition last year; they were entered upon in the best of faith; it was believed by the State Board of Agriculture that in the interests of the Board and in the interests of the State that this Cen-

ennial would be the wise and proper thing to do, financially considered; that it would be a help to unload some of the indebtedness of the State Board, because, as recited in the report of the Treasurer in this resolution, they had accumulated an indebtedness of some \$80,000, hence the Centennial Exposition came in as a factor, but in the end it only added to it. Now the object was not accomplished. Some of us had fears of this result; we remembered the great National Exposition; we remembered that all these grand expositions that celebrate one hundred years ago, always cost more than they come to; therefore, we declined to enter upon this scheme. But what is the situation to-day? The situation brought about in good faith, in the hope that it would diminish instead of increase the indebtedness. But now, what is best to be done? It is not what should have been done a year ago, but what is the situation now. The very grounds of the State Board of Agriculture—of the State, if you please—are in jeopardy. Now the naked question is, shall these grounds pass under the hammer and be sold with all the improvements upon them? Or would it be wiser, in view of the fact that the State owns them, that the State make provisions for lifting the debt? But it is not proper now, in my opinion, to enter into a discussion of details with the Boards, or anything of that kind.

The resolution was adopted.

RESOLUTION No. 2.

WHEREAS, In defiance of the natural law of competition, huge combinations of capitalists are "cornering" the necessities of life, and enriching the few at the expense of the many; and

WHEREAS, One of the most important agricultural interests of Ohio is being crushed by one of these "combines," the rapacious "Beef Trust of the Big Four;" therefore,

Resolved, That we call upon the Legislature to pass such laws as shall protect alike the producer and the consumer of beef within the State.

Mr. Frank Moore: I do not know whether it is worth while to discuss this question or not, but I will simply make a few remarks on the subject as a matter of principle. The question that occurred to me while the resolution was being read was simply this: Is this a free country or not; has a man a right to place his products in our markets; has he a right to place them in any market in the world? And it seems to me when these gentlemen see proper to buy cattle there, subject to the laws and restrictions of the market in their own State, and bring them to the State of Ohio openly, placing in the hands of honorable men and honorable bodies of men their meats, we have no right to say to those gentlemen that they have no right to bring meat here and sell it. It seems to me to be

out of place, and that it is interfering with one of the natural laws of trade. Our market should be open to the world unless the parties are violating some law of the Government. It seems to me a violation of the very foundation of our Government.

Mr. McClung: Mr. President, I confess my interests as a Western man are on the side of shipments of cattle to the East, but while that is true, I can say that my honest convictions are in favor of producers of Ohio within Ohio. What I understand from the entire jurisprudence of our country is, that communities have a right to protect themselves from oppression. Now, my friend intimates that this beef is all of the very best quality; this may be so, or it may not be so. In the system of slaughtering beeves away from here and bringing them here, it may be possible, and very probable that we will get a good deal of beef here, not as good as Ohio beef. If that is true, the people of Ohio should see if they cannot protect themselves.

There is another question as to the financial interest of Ohio. Now while you have no great ranch farms where cattle are handled by the thousand, you have a cattle producing community within yourselves; each farmer having two, or three, or four, or six or more good fat bullocks which are taken care of, and finally they will be brought in the market under your own eyes, and you know when they are fattened within your own border that they are not diseased, and that they are the best you can get anywhere. If this system goes on there will be no remedy. If this doctrine—which is a sort of free trade—goes on, and Ohio allows these meats to be brought in here, you may just as well give up beef producing, and take up some other interest. Are you ready to do that? Is it true policy to let Mr. Armour and other gentlemen go over this country roughshod or not. I am in favor of this resolution, that the law-making power take this matter under their care and protect the people of Ohio in their beef producing interests, and I hope they will take care of it.

A Member: I do not care about entering upon any discussion of this question, but I hope that the law-making power of this State will take hold of this question carefully, candidly and in earnest for the protection of their people, and for that reason I am clearly in favor of the resolution.

Mr. Chaney: We will leave it to the Legislature to test the constitutionality and legality of the question. The resolution ought to pass, but we will leave the decision of the constitutionality to the Legislature, which has time to consider that question. But I am in favor of protecting, not only the producer, but the consumer.

The resolution was adopted.

RESOLUTION No. 3.

WHEREAS, Notwithstanding the laws of Ohio and of the General Government, oleomargarine and butterine continue to be manufactured in large quantities, in such perfect imitation of real butter, and is still sold to deceive and poison the unwary consumer; and

WHEREAS, Such use is against the health of the people and the interests of honest producers of butter and cheese; therefore,

Resolved, That we ask for such further legislation as shall suppress the traffic in the fraudulent article.

Mr. McClung: In framing that resolution your committee had for its object the protection of the people. While we do not undertake to enter into a discussion as to the right and wrong of the question, they do believe that it is right for the General Assembly to take the matter under consideration.

Mr. Moore: I would like to have the resolution read again so I can vote intelligently on it.

The Secretary again read Resolution No. 3.

Mr. Moore: The same question arises as on the previous resolution, only in a different shape. The Legislatures in different States require men, when they manufacture certain articles, to place their stamp on them, and certain products can not be sold without it. Oleomargarine is a healthy and wholesome article if properly made, and the law which requires it to be stamped and to state what it is composed of is a good one; but if people want to buy oleomargarine they ought to have a perfect right to do so. If persons want to buy butter they ought to be able to do it. You say people are defrauded; that the article is not just what it is recommended, and simply because people are defrauded in this instance, prohibit the sale and manufacture entirely. One man sells his goods, placing his stamp on it, and because others misrepresent, hold him responsible and punish him for that act of others, and not because he imposed any fraud or any deceit.

Mr. McClung: It does seem to me that my friend here is disposed to have the largest liberty for everything. Perhaps this is well. I am only surprised that he takes the ground that anything manufactured has a right to be put upon the market; has a right to be sold by the producer at his will without any regard to those he sells to. I regret very much that in this nineteenth century that doctrine finds its way into an Agricultural Convention

We have evidence that evils are restrained by law in the interests of the people. Take morphine, cocaine, ardent spirits, and has not the law-making power come to the front and said, thus far shalt thou go and no farther, simply because it is the interest of the people, and it is the duty

of the Legislature and the jurisprudence of this country to protect these interests. Take for, example, a man who is in the habit of using morphine—and some of our friends are in that dilemma—controlling him so that he is not his own master; the drug that takes away the manhood and destroys everything that is desirable in a man, and puts him down as low as the brute—we ought to have free trade and let him be killed off, according to my friend here—but there is no such theory in this country; we are a proud people; we are proud of ourselves, of our neighbors and of our neighbors' children, and whenever there comes a doctrine that would harm our neighbor or our neighbors' children, we should go to the front and say, you shall go so far but no farther; we will say go to the rear all you that seek to take the lives and the happiness of our people. It is too late for this idea to get lodgment in the breasts of the American people. When in the olden times the voice of God said to Cain, "Where is thy brother?" and he denied all knowledge, saying, "Am I my brother's keeper?" The Lord answered, "The blood of thy brother crieth to me from the ground." He was his brother's keeper, and whenever we find a brother needing help, fix the laws to protect him; hem him in; build him up and protect him. Away with your evils, your curses, your little things that hurt your brother; relegate them to the rear where such devils ought to be.

Mr. Moore: I desire to make a few remarks. I notice my friend here compares oleomargarine to morphine and rum; these are poisons and druggists are compelled by law to place labels on them, and if we desire to purchase them at a drug store, they write down our name and write poison on the label. This is done to protect the people. If we take whisky, the same thing is true, and we are right in placing restrictions on it. It is right to place a label on oleomargarine, saying this is composed of so and so; then the people will know just what they are getting, and then it becomes a legitimate article of commerce. If people prefer to buy the pure article, they ought to be able to do so.

A Member: This discussion is taking a little wider range than was proposed by the committee. It was not the idea to question the constitutional right of the people to eat and drink what they pleased, but the evil sought to be suppressed is one of fraud and deception. I wish I had before me several of the formulas procured in the Patent Office at Washington, giving the ingredients entering into some of the formulas for making butter. I find as many as fourteen different ingredients in some of them. Now, the original oleomargarine may have been composed of tallow, with a little percentage of butter, and it may have been comparatively harmless, but when you make oleomargarine with fourteen different ingredients, among them petroleum, a down-right poison, in some of

them, you have a right to ask protection against fraud; not against oleomargarine, but against the fourteen ingredients which compose it. It is a fraud. We may not question the right of a person to take poison, if they will, but we ought to know what we take. Now I suggest this: wherever the product of artificial butter is put upon the market, let the formula go with it, and let that be sworn to by the manufacturer under the severest penalties. Then, if people want to take the oleomargarine, let them take it.

Col. Brigham: I do not desire to occupy a great deal of time in discussing this question, for it is only a preliminary discussion to be continued in this and other States; let it, therefore, come squarely before us. Our friend here cites as an example, the selling of morphine. Now, if any druggist would sell morphine and label it quinine, the illustration would be applicable. Now, largely the consumption of oleomargarine is by people who think they are eating butter, and there are manufacturers who say that it can scarcely be detected by an expert, and that ninety-nine per cent. of the people who spread it on their bread and biscuit believe it is butter. Is it wrong or is it proper for the consumer to demand of your law-making power that they protect both the consumer and the producer. The report shows that 69,000,000 pounds of artificial butter was manufactured last year, and that 42,000,000 pounds were accounted for, leaving 27,000,000 pounds unaccounted for. What do they want? They do not say you shall not make oleomargarine, but they say you shall not make it in imitation of butter—to look like butter. Take, for instance, the case of a man placing your signature to a note; every man objects to that; he may have no objection to signing his own name to the same thing, but he objects to anybody else doing it. Now, we do not want them to sell this stuff as genuine butter. It may look as well and it may taste as well, but it is not the genuine article, and the law don't protect either the producer or the consumer. Is it right to allow any man to place a product on the market under such conditions? Let them deceive no one. That is where the opposition comes in. They know if a man understands it is oleomargarine he won't touch it, and it is a struggle of life and death with these men. The manufacturers are on one side and the people are on the other, and I do not think it is asking too much of the law-makers to protect every citizen who is imposed on in this way, and this is the object of this resolution.

Resolution adopted.

RESOLUTION No. 4.

WHEREAS, The meeting of breeders of fine stock in Ohio, for discussion and the advancement of their business is absolutely necessary for progress, and holding the trade long enjoyed by Ohio farmers and breeders; and

WHEREAS, There has been great confusion and discouragement arising from want of places and proper hours of meeting in Columbus during the week of the meeting of the Agricultural Convention; therefore,

Resolved, That this Convention recommend to the several cattle sheep and swine-breeders' associations of the State, to appoint one of their number as a delegate to meet with the Secretary of the State Board of Agriculture, at Columbus, at such date as he may fix, and these delegates shall be a committee to arrange for papers and topics for discussion, at a series of meetings to be held annually, during the week of the Agricultural Convention.

Secretary Bonham: There have been, as you all know, a good many efforts made by the different fine stock breeders to have meetings during the week of the Agricultural Convention, and you also know the difficulties in trying to have meetings here at the same time in finding suitable rooms to meet in, and there is in consequence great confusion. At the time of the meeting you will see sheep-breeders running around trying to find their room, the swine-breeders are hunting theirs, and the different cattle-breeders are trying to find their places of meeting. We need some organization to bring order out of this confusion. I suggest that some such arrangement as this be made for the accommodation of the breeders of Ohio. I feel a little pride as a resident of Ohio. While I see what has been done—what is being done—by our sister State, Indiana, for these conventions, the large attendance and the discussions of great interest and profit; and by Illinois and Iowa, do I feel that it is high time for the farmers of Ohio to be up and doing; our reputations are at stake, our pockets are at stake. I see no other way to accomplish this than for this Convention to take the matter in hand and arrange for such meetings full programmes for discussion. I have mentioned this to members of the Swine-Breeders' Association, the Short Horn breeders and others, and they are all in harmony with it, and I hope the Convention will express its views upon it.

The resolution was adopted.

Mr. J. W. Pollock offered the following resolution:

WHEREAS, The General Assembly authorized the Centennial Board to offer premiums for exhibits at the Centennial Exposition held on State Fair Grounds in 1888; and

WHEREAS, The Centennial Board has not been able to pay these premiums in full; therefore,

Resolved, That the General Assembly be urged to provide for the payment in full of premiums offered at Ohio's Centennial.

General Hurst: By the courtesy of this house I will say a few words on this resolution. Not by my own seeking I find myself a member of both these Boards—of the State Board of Agriculture and of the Centennial Board. To-day the Centennial Board winds up its work and goes out

of existence. In these last days of its life, I will not sit still and hear anybody, either a member or a friend of the State Board give it a parting kick. I believe that no greater work was ever done for the industrial interests of Ohio than was done by that Centennial Board. The Centennial Board was created by joint resolution of the General Assembly, and it was directed to take possession of the fair grounds to make an exhibition of the industries of the State representing the progress for the first one hundred years of her life. They could have taken possession absolutely, if they had desired to do so. But on representations of the State Board the Centennial Board agreed to go forward, and out of its own resources pay this indebtedness of the State Board as it had to be paid, and in so far as necessary to pay its indebtedness; that obligation has been kept. The Centennial Board has been driven to this course because they were ordered by the General Assembly to hold it on the fair ground, and if a foreclosure of these lands should occur, it would disturb the rights of the Board, and would disturb the operations of the Centennial. Out of these obligations the Centennial Board paid \$10,280 up to the close of the Centennial. I might say that the entire amount of premiums awarded at the Centennial probably amounted to \$40,000; during the continuance of the Centennial \$24,000 was paid in full, leaving \$16,000 unpaid. Up to within a few days of the close of the Centennial we were fully confident of being able to pay all liabilities, but the disastrous weather defeated the coming of the crowd and diminished our resources so that we were unable to meet the obligations. When this fact dawned upon us, it was decided to meet no more liabilities until they were definitely determined, and then pay a pro rata. This was the only just thing to do. When all the assets were definitely determined it was found that we could pay about fifty per cent. \$16,000 remained unpaid, and we had about \$8,000 with which to pay it. Fifty-five per cent. was paid to live stock men, and forty-five per cent. to all others; the additional ten per cent. was given to pay the live stock men for entering their stock. Thus it will be seen that the Centennial Board has paid to the State Board, as trustees, \$10,283, and their apparent deficit is but \$8,000. If they had not paid that \$10,283 they would be able to pay all premiums in full and have a surplus over. So I declare that the apparent deficit of the Centennial Board is only apparent, and that the State received in all \$10,283, and can well afford to pay these four hundred exhibitors what is due them. The Centennial Board was ordered to offer these premiums, and if they had not paid to the State Board \$10,000 they would have had enough to pay the premiums in full. But these premiums could not be paid in full, and I think it is a very proper thing to

say that these four hundred exhibitors ought to have all the money due them. I am therefore heartily in favor of this resolution.

Mr. McClung: As I understand it now, the State Board of Agriculture owes about \$50,000 and the Centennial Board about \$8,000. Let us have the \$8,000 paid and the other, too.

The resolution was adopted.

Recess until 7:30 P. M.

EVENING SESSION.

The Convention was called to order at 7:30 P. M., by the President, who announced that the first thing in order would be the distribution of ballots among the members preparatory to the election of five members of the State Board of Agriculture, and appointed J. W. Pollock and J. C. Levering as tellers to count the ballots.

The President: The members will take the printed tickets and select five names they will vote for, and erase all others, then as the counties are called the delegate from each county will go forward and deposit his ballot with the tellers. The Secretary will call the roll of the counties.

Secretary Bonham: I will call three or four counties at a time, and the delegates will please come forward and deposit their ballots with the tellers.

As the roll of counties was called, the members came forward and deposited their ballots. The tellers then proceeded to count the ballots. After the count was completed the President announced that the Secretary would announce the result of the ballot.

Secretary Bonham: Sixty-seven votes cast; necessary to a choice, 34; A. Cunningham, 23; J. G. Russell, 36; J. B. Hoge, 24; W. E. Watkins, 18; A. H. Kling, 47; W. W. Miller, 33; H. S. Grimes, 45; J. F. Neisz, 7; J. B. Pumphrey, 27; Alex. J. Clark, 30; Benj. F. Swingle, 13; J. W. Edwards, 20.

The President: The result of the ballot is as follows: J. G. Russell, A. H. Kling and H. S. Grimes are elected. There are yet two members to be elected. Prepare your ballots. Erase all the names except two. The Secretary will proceed to call the roll of counties and the delegates will come forward and deposit their votes.

After the tellers had counted the ballots, Secretary Bonham announced the result as follows: Sixty-nine votes cast; necessary to a choice, 35; A. Cunningham, 11; J. B. Hoge, 12; W. E. Watkins, 9; W. W. Miller, 32; J. F. Neisz, 4; J. B. Pumphrey, 20; Alex. J. Clark, 26; Benj. F. Swingle, 4; J. W. Edwards, 15.

The President: You will see no candidate has been elected, and you will proceed therefore to ballot again. The Secretary will call the roll of counties.

After the ballots were deposited the tellers proceeded to count them, and the Secretary announced the result as follows: Sixty-nine votes cast; necessary to a choice, 35; A. Cunningham, 7; J. B. Hoge, 9; W. E. Watkins, 4; W. W. Miller, 43; J. B. Pumphrey, 16; Alex. J. Clark, 32; Benj. F. Swingle, 5; J. W. Edwards, 15.

The President: Mr. W. W. Miller has been elected on the third ballot.

Mr. Murphy: I desire to make a few remarks. There is a gentleman on the ticket, a candidate from Southern Ohio, that will make as good a member of the Board as any man that is on it. I refer to Mr. J. W. Edwards, from the extreme southern part of the State, a part which has no representative on the Board as yet, and it is the very part of the State of Ohio that is taxed more heavily than any other part of the State, because the appraised value of the real estate is higher, and to let the extreme southern part go without representation on this Board is wrong. That is all I have to say. Mr. Edwards will make an excellent man for the Board.

The motion was made and adopted, that the three candidates having the lowest number of votes should be dropped after this ballot.

Mr. Lyon: I desire on behalf of one of the candidates to withdraw the name of Mr. J. B. Pumphrey, and in doing so I thank you for your courtesy.

A Member: I wish to correct a statement in reference to there being no representation from the southern part of the State. Mr. Grimes is from Scioto, one of the best counties of the State.

The President: You will proceed to ballot again. I am advised to say, you to scratch all the names on your ticket but one. The Secretary will call the roll of counties.

After the ballots were deposited the tellers proceeded to count them, and the Secretary announced the result as follows: Sixty-eight ballots cast; necessary to a choice 35; A. Cunningham, 4; J. B. Hoge, 1; J. B. Pumphrey, 2; Alex. J. Clark, 39; J. W. Edwards, 22.

The President: Mr. Alex. J. Clark is elected. We are now ready for the consideration of any miscellaneous business that may be presented.

Mr. Sites: I desire to present the following resolution:

WHEREAS, Ohio is one of the leading agricultural States of the Union, equal in her products to any other State of her territorial area, her industries pushed by enterprise and intelligence, and centrally located among the sisterhood of States; therefore,

Resolved, That should a change be made in the head of the National Department of Agriculture, we recommend for that position the Hon. J. H. Brigham, of Delta, Ohio.

The resolution was unanimously adopted.

Mr. Foster: I move that we return a vote of thanks to the Senate for giving us the use of the Senate Chamber, and also a vote of thanks to the Sergeant-at-Arms for his services in preserving order.

The motion carried.

The President: If there is any other business proper to come before the Convention we will be glad to hear it.

Senator Alexander: I do not know but I might almost be considered an interloper, but I have attended twenty-five of these meetings; for twenty-five years I have attended these meetings of the Ohio State Board of Agriculture. I served twelve years in my own society and four years on this Board. I am now a member of this House, and I need not say to you that every member of this House ought to be interested in the action of this Board every year. I have been in your meeting to-day, and have listened very attentively to all your proceedings. You should have better meetings; you should have a longer meeting; a meeting in which there should be a prepared programme; and you should come down here each winter and say to these men who are associated here together to make laws for you, what you want at home. There are many subjects that interest the farmers of Ohio that should be discussed at these meetings. I should say there are twenty-five bills—perhaps one hundred—on the calendar which directly refer to the interests of the farmer, and why should not a delegate from each county come down here and have something to say as to what you need at home. Why should not these meetings be made instructive to the members of the General Assembly who are here to make laws for you.

I am just going to spend one minute on the subject you have asked us to act on; I refer to your action on the dressed beef question. Now, I know hundreds of good farmers who think that all that is to be done to have this beef question settled is to have a bill pass this House. Now, I stand here to say what I know is unpopular, that no General Assembly in the United States has any authority to pass any such measure, and any man that puts an article for commerce and trade on the market in good order has a right to sell it in any State in the Union. You should not advise the Legislature to do a thing that cannot be done, and then go home and say that they are "good for nothing." If we pass a law that all animals shall be inspected before being killed, will that prevent Chicago from sending cattle here? There is no law that will prevent Illinois from sending good clean meat into Ohio for sale. I suggest that you have longer meetings and better meetings, and that you offer us something to digest down here. I am only a servant of the people, and I am willing to help you if I can, but you ask an impossibility when you ask us to create

a law that could not be enforced. You must face these facts, and to legislate against them is to violate the Inter-State laws of trade between the States.

Now, Mr. Chairman, this was unasked. I don't expect anything for it. I can only thank you for listening, and trust when this Board meets next year that you digest a plan and say to us fellows what we ought to do, and do not give us such hard conundrums as this beef question.

I live in Akron, and the question came to us up there as early as to any other town. We had a gentleman who bought his beef cattle in Chicago and brought them to Akron in cars to his slaughter-house, and killed them there and distributed them. Thereupon the labor organizations met and agreed that they would not buy any meat that came on foot from Chicago. No more was brought on foot, but Mr. Armour came to Akron, rented three nice rooms, and said, "We will sell you meat in ten days from now," and they did, selling it at something less in price. The result was that Armour's three meat markets were besieged until everything was gone—cleaned out every day by the very men who said they would not buy meat sent from Chicago on foot, and in a week's time every meat shop in Akron was bankrupt. The people went to these markets, where they found better beef for less money. We have just as bad meat offered us by farmers as could possibly be shipped. Last week a man was arrested for bringing diseased meat into Akron. The law that would punish the Illinois dealer and let a man slip, living within five miles of the city, is not a very good law. Now, you should stay long enough to point out a road. The whole beef industry is prostrated; no one can get one-half what he should get, but we must remember that the entire beef industry, even in the far west, was never so depressed. A friend of mine who came from New Mexico the other day brought 177 head of four-year-old steers, first-class, good weight, and they only brought \$31 a head in Kansas City. I simply suggest this, that cattle do not bring any more in other places than they do here. You may be forced to pay more by the butchers in your cities, but the remedy is not to shut out good clean meat.

Mr. Sites: The gentleman can see no solution of this question, and yet he admits that not only are the beef interests of Ohio depressed fearfully and ruinously, but also the beef interests of the great West are just as badly depressed. We have not resolved in favor of any particular remedy. We recite an evil which the Senator admits to a greater extent than we did. He goes further than we did. We confined ourselves to the State of Ohio, both to the producer and consumer, but he goes to the far West and says the producer of beef is in reduced circumstances and almost ruined. What has done it? Has providence done it? It has been brought about by the concentration and combination of capital

determined to become millionaires at the expense of the beef industries of this country. It is not peculiar, this great gang of combines; they are all over this country for the purpose of robbing honest labor—the producer and consumer. The middle men, appointed for the sale, however, all make money rapidly out of the wants and necessities of the honest industries of this country. I say to the Senator, if he can find no remedy in the State of Ohio, let him appeal to some other authority to settle it. This Convention has not set out to decide this question, it leaves the Legislature to find the remedy. The great trusts that are organizing all over this country, what do they do? What does this great beef trust do? It is piling up millions for those who operate it, but the people themselves are sufferers and losers—honest farmers are the sufferers. Now, then, what is the remedy? I suggest that we may have to go further, because they are national; they are not confined to the State of Ohio. They are not only national, but they are becoming international. I expect in the near future to see these great trust companies become international, covering the whole world with their network, controlling the prices of necessities; giving producers what they please and getting from the consumer what they please. I agree with the Senator that this is a question not to be decided hastily, but time should be taken to consider it.

I desire to call attention to one question of interest to me, and one I would like to hear discussed—the management of county societies. There are many of us who need much more light than we have.

Senator Alexander: If the brother had suggested a remedy he would have done just what we wanted. You take my place and tell us what would you do. I am sorry to acknowledge that I went to church the other night and heard corporations torn to pieces, and when the preacher got through with that he said that combinations were better than cut-throat competition, and I came home just as ignorant as I went, and unless you give me some information I shall go home just as ignorant as I came here.

A Member: I was a little wounded at the comparison made between beef brought here in cars and beef raised by farmers in this State. St. Louis always makes a distinction between home-fed steers and shipped cattle, the former always bringing a much better price.

Senator Alexander: I am not here to justify or screen or defend any trust or any monopoly. I am here with all my strength to put ourselves in shape, and I desire that you point out the way to me so that I can meet these things that are out of my reach. I know if somebody had started this discussion this morning we would have been informed on many points.

The President: The subject is an interesting one, and it would seem

that some means should be devised by which these subjects could be brought before the Convention. However, I should say that the introduction of this resolution was more for the purpose of getting it before the General Assembly rather than to demand action, and it is presumably their work to devise some means of bringing about a better condition of affairs. The resolution provided for a general meeting of the representatives of different breeding associations of the country with the Secretary of this Board for the discussion of topics which will meet the case, and if these questions are not brought up in the Agricultural Convention they can be brought up elsewhere and discussed.

A Member: Mr. Chairman, I move we now adjourn.

Motion carried.

TABLE I.—OFFICERS OF COUNTY AGRICULTURAL SOCIETIES AND TIMES OF HOLDING COUNTY FAIRS IN OHIO FOR 1888.

Counties.	President.	Post-office.	Treasurer.	Post-office.
Allen	W. E. Watkins.....	Delphos	J. B. Roberts.....	Lima.
Ashabula	Thos. McGovern.....	Geneva	A. C. White.....	Jefferson.
Athens	J. C. Bower	Athens	A. J. Frame.....	Athens.
Auglaize	John A. Werst	Wapakoneta	Midd. Lucas	Wapakoneta.
Brown.....	J. P. Richards.....	Georgetown	E. F. Blair	Georgetown.
Carroll	Jos. McGregor	Carrollton	C. G. Fawcett	Carrollton.
Champaign	C. H. Ganson	Urbana.....	I. O. Tritt.....	Urbana.
Clarke.....	Chas. Stewart	Springfield.....	Jas. D. Boyd	Springfield.
Clermont	Harmon Cover	Monterey	J. W. Duckwell	Batavia.
Clinton	O. F. Petticoord	Wilmington	J. W. Denver, Jr	Wilmington.
Columbiana	L. S. Lyder	East Fairfield	Ed. A. King	New Lisbon.
Coshocton	Lewis DeMoss.....	Coshocton	J. L. Rue	Coshocton.
Crawford	C. G. Malice.....	Bucyrus	J. H. Robinson.....	Bucyrus.
Cuyahoga.....	T. W. Scott	Chagrin Falls	A. M. Williams	Chagrin Falls.
Darke	J. P. Meeker.....	Arcanum	S. A. Hostetter	Ansonia.
Defiance	J. F. Deotrick.....	Defiance	A. Sauer.....	Defiance.
Delaware	Jos. H. Dunlap.....	Delaware	H. A. Welsh	Delaware.
Erie.....	C. H. Rockwell.....	Prout	F. P. Zollinger	Sandusky.
Fairfield.....	Thos. H. Wetzler	Lancaster	A. I. Vorges.....	Lancaster.
Fayette	H. D. Purcell	Washington C. H.....	H. M. Daugherty.....	Washington C. H.
Fulton	L. G. Ely	West Unity	J. W. Howard.....	Winameg.
Gallia	C. D. Bailey	Gallipolis	J. J. Pool	Gallipolis.
Geauga.....	A. B. Wells.....	Claridon	H. C. Tuttle.....	Burton.
Guernsey	A. J. Clark	Cambridge	R. S. Frame.....	Washington.
Hamilton	Albert French.....	Oakley	N. S. Buxton.....	Pleasant Ridge.
Hardin	Geo. P. Frame	Kenton	Ed. H. Wilson	Kenton.
Harrison	W. W. Jamison	Cadiz.....	W. S. Cessna	Cadiz.
Henry	Rufus Spangler	Majunga	J. C. McLain.....	.....

TABLE I—Continued.

Counties.	President.	Post-office.	Treasurer.	Post-office.
Hooking.....	Maynard Pond.....	Logan.....	Jas. Little.....	Logan.....
Holmes.....	Joseph Sharp.....	Berlin.....	Geo. Adams.....	Millersburg.....
Huron.....	E. E. Little.....	Norwalk.....	E. G. Gardiner.....	Norwalk.....
Jefferson.....	D. P. Sutherland.....	Updegraff.....	Chas. McKinney.....	Smithfield.....
Knox.....	C. A. Young.....	Mt. Vernon.....	B. S. Cassel.....	Mt. Vernon.....
Lake.....	E. W. Taylor.....	Painesville.....	L. L. Thompson.....	Painesville.....
Licking.....	Wm. C. Hall.....	Newark.....	S. F. Van Vorhees.....	Newark.....
Logan.....	Ezra Brown.....	Zanesfield.....	J. B. Williams.....	Belleville.....
Lorain.....	A. H. Mooers.....	Elyria.....	E. E. Williams.....	Elyria.....
Marion.....	John McElvy.....	Cochran.....	S. H. Rupp.....	Marion.....
Medina.....	Thos. G. Briggs.....	Sharon.....	R. M. McDowell.....	Medina Village.....
Mercer.....	H. B. Bennett.....	Montezuma.....	B. F. Klingner.....	Calina.....
Miami.....	D. C. Branson.....	Covington.....	W. H. Alexander.....	Troy.....
Monroe.....	I. P. Farquhar.....	Woodsfield.....	W. C. Mooney.....	Woodsfield.....
Morgan.....	Jno. A. Floyd.....	Meigsfield.....	W. A. Vincent.....	McConnelsville.....
Morrow.....	M. H. Henderson.....	Harwood.....	D. V. Wherry.....	Mt. Gilead.....
Muskingum.....	Hiram Waller.....	Zanesville.....	Chas. Horsuch.....	Zanesville.....
Noble.....	W. S. Spriggs.....	Sarahsville.....	J. T. Davis.....	Sarahsville.....
Paulding.....	Geo. W. Forder.....	Antwerp.....	A. B. Lee.....	Paulding.....
Perry.....	Sam'l Arnold.....	New Lexington.....	T. J. Smith.....	New Lexington.....
Pickaway.....	Job R. Benick.....	Circleville.....	Wm. Foreman.....	Circleville.....
Preble.....	W. H. Snyder.....	Lewisburgh.....	C. F. Brooks, Jr.....	Eaton.....
Putnam.....	John T. Mallaham.....	Ottawa.....	N. E. Mathews.....	Ottawa.....
Richland.....	Miller Carter.....	Mansfield.....	G. F. Carpenter.....	Mansfield.....
Ross.....	Alexander Kenick.....	Chillicothe.....	Theo. Spetnagle.....	Chillicothe.....
Sandusky.....	A. E. Wagner.....	Lindey.....	W. P. Haynes.....	Fremont.....
Seneca.....	H. S. Grimes.....	Portsmouth.....	E. F. Draper.....	Portsmouth.....
Shelby.....	John Seitz.....	Tiffin.....	Jno. B. Runyan.....	Tiffin.....
Stark.....	E. Blanchard.....	Oran.....	Isaac Betts.....	Sidney.....
	T. C. Putnam.....	Beach City.....	M. A. Wise.....	Canton.....

Summit	W. C. Sackett	Akron	A. T. Palge	Akron
Trumbull	S. F. Bartlett	Warren	Robert T. Izant	Warren
Tuscarawas	B. D. Downey	New Philadelphia	Jesse D. Baker	Canal Dover
Union	G. Liggett	Watkins	W. H. Robb	Marysville
Van Wert	George Lewis	Van Wert	C. A. Melshelmer	Van Wert
Warren	Samuel Irons	Lebanon	Robt. G. Hufford	South Lebanon
Washington	L. W. Ellenwood	Marietta	Henry Roesser	Marietta
Wayne	A. Cunningham	Wooster	W. A. Wilson	Wooster
Wood	Frank Powell	Haskins	Frank Yost	Tontogany
Wyandot	S. H. Hurt	Upper Sandusky	Ed. A. Gordon	Upper Sandusky

TABLE I—Concluded.

Counties.	Secretary.	Post-office.	Time of Fair.	Place of Fair.
Allen.....	S. D. Crites	Elida.....	Sept. 4, 5, 6 and 7.....	Lima.
Ashabula	E. J. Pinney	Jefferson	Sept. 25, 26, 27 and 28.....	Jefferson.
Athens	R. E. Hamblin	Athens	Oct. 3, 4 and 5.....	Athens.
Anglaize	Jacob Hause	Wapakoneta	Oct. 2, 3, 4 and 5	Wapakoneta.
Brown.....	W. H. Wilson.....	Georgetown	Oct. 2, 3, 4 and 5	Georgetown.
Carroll	Geo. H. Aller	Carrollton .....	.....	.....
Champaign	J. W. Crowl.....	Urbana	Aug. 28, 29, 30 and 31.....	Urbana.
Clarke	L. B. Sprague	So. Charleston	Aug. 20, 21, 22, 23 and 24.....	Springfield.
Clermont	J. H. Burns.....	Monterey	Sept. 4, 5, 6 and 7.....	New Boston.
Clinton	N. M. Linton.....	Wilmington	July 31, Aug. 1, 2 and 3.....	Wilmington.
Columbiana.....	W. A. Morgan	New Lisbon	Sept. 25, 26 and 27.....	New Lisbon.
Coshocton	L. W. Pocock	Coshocton.....	Oct. 10, 11 and 12.....	Coshocton.
Crawford	E. J. Gifford	Bucyrus	Sept. 25, 26, 27 and 28.....	Bucyrus.
Cuyahoga.....	C. H. Hubbell	Chagrin Falls	Sept. 11, 12, 13 and 14.....	Chagrin Falls.
Darke	J. N. Lowry	Greenville	Sept. 17, 18, 19, 20 and 21.....	Greenville.
Defiance	Jno. C. Woods.....	Defiance	Aug. 27, 28, 29, 30, 31 and Sept. 1.....	Defiance.
Delaware	W. E. Moore.....	Delaware	Aug. 28, 29, 30 and 31.....	Delaware.
Erie.....	Jno. T. Mack.....	Sandusky	Sept. 18, 19, 20 and 21.....	Sandusky.
Fairfield	W. T. McClenaghan	Lancaster	Oct. 9, 10, 11, 12 and 13.....	Lancaster.
Fayette	John A. Worrell.....	Washington C. H.	Aug. 28, 29, 30 and 31.....	Washington C. H.
Fulton	L. W. Brown	Wauecon	Sept. 18, 19, 20 and 21.....	Wauecon.
Gallia	P. T. Wall	Gallipolis	Aug. 30, 31 and Sept. 1.....	Gallipolis.
Geauga	P. W. Parmelee	Burton	Sept. 18, 19, 20 and 21.....	Burton.
Guernsey	V. D. Craig	Washington	Sept. 26, 27 and 28.....	Washington.
Hamilton	S. B. Hammel	Cincinnati	Aug. 21, 22, 23 and 24.....	Carthage.
Hardin	O. W. Squier	Kenton	Sept. 4, 5, 6 and 7.....	Kenton.
Harrison	Jacob Jarvis	Cadiz.....	Oct. 2, 3, 4 and 5.....	Cadiz.
Henry	C. E. Weeks	McClure .....	.....	McClure.
Hocking	J. M. Floyd	Logan	Oct. 3, 4, 5 and 6.....	Logan.
Holmes	J. G. Bilderback.....	Millersburg	Sept. 25, 26, 27 and 28.....	Millersburg.
Huron	F. R. Loomis	Norwalk	Sept. 11, 12, 13 and 14.....	Norwalk.
Jefferson.....	R. F. Henderson.....	Smithfield	Sept. 26, 27 and 28.....	Smithfield.

Knox	Chas. E. Oritchfield	Mt. Vernon	Aug. 28, 29, 30 and 31	Mt. Vernon.
Lake	Geo. A. Fates	Painesville	Sept. 10, 11, 12 and 13	Painesville.
Locking	J. F. Hartshorn	Newark	Oct. 2, 3, 4, 5 and 6	Newark.
Logan	R. F. Tremain	Bellefontaine	Oct. 2, 3, 4 and 5	Bellefontaine.
Lorain	Orville Root	Elyria	Sept. 4, 5, 6 and 7	Elyria.
Marion	H. M. Ault	Marion	Sept. 25, 26, 27 and 28	Marion.
Medina	Thos. S. Shaw	Medina Village	Sept. 4, 5 and 6	Medina.
Mercer	S. A. Armstrong	Celina	Sept. 25, 26, 27 and 28	Celina.
Miami	W. I. Tenney	Troy	Oct. 1, 2, 3, 4 and 5	Troy.
Monroe	Geo. P. Dorr	Woodsfield	Sept. 11, 12 and 13	Woodsfield.
Morgan	J. W. McElhiney	McConnelsville	Oct. 9, 10, 11 and 12	McConnelsville.
Morrow	T. D. Riddle	Climax	Oct. 2, 3, 4 and 5	Mt. Gilead.
Muskingum	John O. Green	Zanesville	Aug. 28, 29, 30 and 31	Zanesville.
Noble	Joseph Johnson	Sarahsville	Sept. 5, 6 and 7	Sarahsville.
Paulding	Joel I. Wilkins	Paulding	Sept. 11, 12, 13 and 14	Paulding.
Perry	H. M. Tusing	New Lexington	Sept. 26, 27 and 28	New Lexington.
Pickaway	Milt Morris	Circleville	Oct. 2, 3, 4 and 5	Circleville.
Preble	J. H. Conger	Eaton	Sept. 24, 25, 26, 27 and 28	Eaton.
Putnam	W. W. Sutton	Ottawa	Oct. 2, 3, 4, 5 and 6	Ottawa.
Richland	M. D. Ward	Mansfield	Aug. 28, 29, 30 and 31	Mansfield.
Ross	H. W. Woodrow	Chillicothe	Aug. 14, 15, 16 and 17	Chillicothe.
Sandusky	M. G. Thraves	Fremont	Oct. 2, 3, 4 and 5	Fremont.
Scioto	Chas. W. Zell	Portsmouth	Aug. 7, 8, 9 and 10	Portsmouth.
Seneca	W. S. Cramer	Tiffin	Sept. 11, 12, 13 and 14	Tiffin.
Shelby	G. C. Anderson	Sidney	Sept. 25, 26, 27 and 28	Sidney.
Stark	J. F. Niecz	Canton	Sept. 24, 25, 26, 27 and 28	Canton.
Summit	H. A. Peck	Akron	Oct. 2, 3, 4 and 5	Akron.
Trumbull	E. D. Kennedy	Warren	Sept. 5, 7 and 8	Warren.
Tuscarawas	John J. Jurgene	Canal Dover	Oct. 2, 3, 4 and 5	Canal Dover.
Union	E. W. Porter	Marysville	Oct. 2, 3, 4 and 5	Marysville.
Van Wert	O. D. Swartout	Van Wert	Sept. 4, 5, 6 and 7	Van Wert.
Warren	Geo. W. Carey	Lebanon	Aug. 28, 29, 30 and 31	Lebanon.
Washington	E. S. Alderman	Marietta	Sept. 12, 13 and 14	Marietta.
Wayne	I. N. Kinney	Wooster	Oct. 2, 3, 4 and 5	Wooster.
Wood	J. S. Matthews	Tontogany	Sept. 25, 26, 27, 28 and 29	Tontogany.
Wyandot	C. D. Hare	Upper Sandusky	Oct. 2, 3, 4 and 5	Upper Sandusky.

TABLE II.—ENTRIES AND AWARDS, COUNTY FAIRS IN OHIO, 1888.

Counties.	Thoroughbreds.			Roadsters.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	33	\$63 00	\$42 84			
Allen	11	96 00	45 00	55	\$101 00	\$95 00
Ashland						
Ashtabula				109	118 00	101 00
Athens	9	85 00	51 00	41	68 00	48 00
Auglaize	4	86 00	14 00	27	66 00	60 00
Belmont	1	67 00				
Brown	9	70 00	63 00	45	102 00	102 00
Butler				115	105 00	105 00
Carroll				50	119 00	102 00
Champaign	4	15 00	9 00	126	139 00	129 00
Clarke	6	99 00		117	196 00	158 00
Clermont				70	87 00	87 00
Clinton				40	108 00	99 00
Columbiana				67	122 00	119 00
Coshocton	10	106 00	42 00	48	201 00	186 00
Crawford		24 00		27	124 00	77 00
Cuyahoga				8	28 50	22 00
Darke	1	96 00	7 20	35	186 00	154 80
Defiance						
Delaware						
Erie						
Fairfield	12	144 00	80 00	73	185 00	185 00
Fayette						
Franklin						
Fulton	21	120 00	65 00	40	86 00	86 00
Gallia						
Geauga	18	60 00	45 00	97	111 00	81 00
Greene	2	70 00	15 00	63	257 00	156 00
Guernsey						
Hamilton	6	208 00	27 00	86	104 00	104 00
Hancock				44	107 00	94 00
Hardin	36	109 00	72 00	43	121 00	100 00
Harrison	3	18 00	7 20			
Henry						
Highland				24	96 00	96 00
Hocking	1	111 00	9 00	20	117 50	66 00
Holmes	18	377 00	40 00	40	145 00	100 00
Huron				64	115 00	92 00
Jackson						
Jefferson						
Knox						
Lake						
Lawrence	1	86 00				
Licking	8	127 00	58 00	37	151 00	136 00
Logan	43	282 00	182 00	109	174 00	149 00
Lorain				44	63 00	54 50
Lucas	99			58		
Madison						
Mahoning	24	158 00	97 00	61	117 00	104 00
Marion	2	83 00	20 00	27	90 00	71 00
Medina	14		32 50	102		77 00
Melgs						
Mercer	1	20 00	10 00		143 00	108 00
Miami	4	103 00	28 00	71	147 00	127 00
Monroe				8	38 00	15 00
Montgomery						
Morgan	4	40 00	10 00	25	70 00	36 00
Morrow				70	118 00	110 00
Muskingum	7	86 00	33 00	26	120 00	75 00
Noble	8	60 00	12 00			
Ottawa	9			6		
Paulding	21	148 00	50 00			
Perry				9	80 50	27 50

TABLE II—Continued.

Counties.	Thoroughbreds.			Roadsters.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	7	\$76 00	\$71 00	69	\$166 00	\$161 00
Pike				56	219 00	173 00
Portage				79	149 00	180 00
Preble				53	95 00	88 00
Putnam	6	46 00	46 00	40	70 00	50 00
Richland	37	252 00	120 00	73	182 00	177 00
Ross	4	30 00	25 00	18	90 00	90 00
Sandusky	4	16 00	16 00	20	114 00	101 00
Scioto				43	122 00	82 00
Seneca				6	153 00	120 00
Shelby	1	57 00	6 00	62	190 00	161
Stark	42	447 00	233 00	119	237 00	147
Summit				125	100 00	81 00
Trumbull	21	60 00	27 00	23	112 00	72 00
Tuscarawas	8	89 00	24 00	66	84 00	61 00
Union	70	66 00	58 00	29		50 00
Van Wert	15	97 00	80 00			
Vinton				23	51 00	51 00
Warren				36	98 00	49 00
Washington	4	182 00	18 00	38	99 00	54 00
Wayne	5	94 00	12 00			
Williams						
Wood	4	13 00	13 00	45	80 00	48
Wvandot				42	172 00	152 00
Totals	673	\$4,702 00	\$1,910 74	3,366	\$7,275 50	\$5,985 80

TABLE II—Continued.

Counties.	General purpose.			Draft.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adam.....	57	\$64 00	\$43 52	14	\$56 00	\$38 08
Allen.....	85	101 00	75 00	39	101 00	75 00
Ashland.....						
Ashtabula.....	96	118 00	87 00	53	80 00	61 00
Athens.....	18	68 00	86 00	24	68 00	48 00
Auxlaize.....	69	97 00	97 00	46	98 00	88 00
Belmont.....	21	116 00		20	109 00	
Brown.....	58	137 00	139 00	31	132 00	108 00
Butler.....	189	178 00	173 00	81	173 00	170 00
Carroll.....	67	119 00	96 00	36	119 00	80 00
Champaign.....	70	76 00	66 00	110	92 00	87 00
Clarke.....	76	325 00	149 00	101	297 00	201 00
Clermont.....	165	181 00	168 00	106	160 00	146 00
Clinton.....	53	258 00	220 50	32	271 00	171 00
Columbiana.....	95	122 00	102 00	53	180 00	150 00
Coshocton.....	45	192 00	173 00	50	285 00	220 00
Crawford.....	28	124 00	80 00	29	124 00	87 00
Cuyahoga.....	80	97 50	79 50	12	81 00	25 50
Darke.....	58	255 00	164 20	61	491 00	331 20
Defiance.....						
Delaware.....	45	95 00	75 00	102	249 00	155 00
Erie.....						
Fairfield.....	47	195 00	180 00	33	195 00	141 00
Fayette.....						
Franklin.....						
Fulton.....	48	86 00	86 00	51	86 00	86 00
Gallia.....	25	90 00		19	80 00	
Geauga.....	99	111 00	100 50	39	69 00	28 00
Greene.....	46	92 00	85 00	45	296 00	142 00
Guernsey.....	28	70 00	40 00	28	70 00	53 00
Hamilton.....	142	180 00	170 00	55	133 00	133 00
Hancock.....	57	131 00	107 00	57	266 00	170 00
Hardin.....	45	121 00	101 00	59	121 00	108 00
Harrison.....	70	104 00	40 00	63	129 00	40 20
Henry.....						
Highland.....	24	78 00	78 00	25	112 00	112 00
Hocking.....	23	141 50	43 50	11	130 00	57 50
Holmes.....	47	134 00	115 00	37	140 00	68 00
Huron.....	56	115 00	78 00	19	115 00	65 00
Jackson.....						
Jefferson.....	56	96 00	94 00	36	103 00	77 00
Knox.....						
Lake.....						
Lawrence.....	18	65 00	44 00	4	58 00	
Licking.....	38	168 00	135 00	44	174 00	167 00
Logan.....	106	174 00	162 00	84	174 00	162 00
Lorain.....	62	72 00	55 00	38	60 00	58 50
Lucas.....	39			17		
Madison.....						
Mahoning.....	83	112 00	77 00	50	96 00	80 00
Marion.....	27	105 00	68 00	76	312 00	152 00
Medina.....	97		85 00	43		77 00
Meigs.....						
Mercer.....		143 00	128 00		296 00	270 00
Miami.....	72	139 00	127 00	71	289 00	246 00
Monroe.....	11	60 00	21 00	1	19 00	3 00
Montgomery.....						
Morgan.....	35	70 00	44 00	30	77 00	48 00
Morrow.....	73	118 00	118 00	85	304 00	208 00
Mustingum.....	11	119 00	46 00	18	120 00	48 00
Noble.....	9	88 50	30 00	8	46 50	28 00
Ottawa.....	21			14	646 00	504 00
Paulding.....	32	188 00	60 00	25	101 00	56 00
Perry.....	27	89 00	67 50	11	91 00	58 00

TABLE II—Continued.

Counties.	General purpose.			Draft.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	42	\$208 00	\$158 00	49	\$219 00	\$208 00
Pike	90	160 00	129 00	20	160 00	85 00
Portage	72	141 00	181 00	49	115 00	108 00
Preble	94	206 00	184 00	52	216 00	145 00
Putnam	16	73 00	43 00	17	73 00	42 00
Richland	17	113 00	70 00	66	288 00	209 00
Ross	54	100 00	100 00	100	170 00	170 00
Sandusky	13	60 00	43 00	23	140 00	94 00
Scioto	27	164 00	110 00	20	93 00	63 00
Seneca	58	180 00	133 00	50	218 00	117 00
Shelby	76	308 00	256 00	27	339 00	126 00
Stark	57	138 00	129 00	36	237 00	130 00
Summit	117	100 00	82 00	59	86 00	58 00
Trumbull	36	100 00	78 00	34	100 00	84 00
Tu-Can-awas	48	66 00	58 00	33	218 00	138 00
Union	46	84 00	70 00	49	78 00	65 00
Van Wert	29	103 00	60 00	10	103 00	22 00
Vinton	59	142 00	132 00	39	104 00	78 00
Warren	25	90 00	65 50	24	90 00	45 00
Washington	35	128 00	47 40	56	118 00	57 00
Wayne						
Williams	44	80 00	50 00	20	80 00	28 00
Wood	8	23 00	23 00	56	292 00	183 00
Wyandot						
Totals	3,957	\$7,880 50	\$6,901 12	3,085	\$11,502 50	\$7,737 98

TABLE II—Continued.

Counties.	Light harness and saddle.			Sweepstakes.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	19	\$15 00	\$11 80	4	\$4 00	\$4 00
Allen	7	15 00	15 00	21	16 00	16 00
Ashland						
Ashtabula				27	84 00	26 00
Athens	71	26 00	18 00	3	30 00	30 00
Auglaize	16	66 00	82 00	25	15 00	15 00
Belmont	53	126 00		4		
Brown	88	176 00	176 00			
Butler	42	83 00	83 00	87	140 00	140 00
Carroll	33	67 00	67 00	2	15 00	15 00
Champaign	7	30 00	30 00	25	30 00	30 00
Clarke	38	77 00	58 00	73	324 00	202 00
Clermont	87	124 00	121 00			
Clinton	11	100 00	60 00			
Columbiana	92	23 00	23 00	9	42 00	34 00
Coshocton				9	60 00	60 00
Crawford				11	40 00	40 00
Cuyahoga	12	28 00	25 00	7	22 00	17 00
Darke	6	53 00	34 20	20	330 00	109 00
Defiance						
Delaware	75	132 00	106 00	18	80 00	60 00
Erie						
Fairfield	36	120 00	102 00	17	100 00	100 00
Fayette						
Franklin						
Fulton						
Gallia				20	60 00	
Geauga	28	24 00	21 00	31	24 00	24 00
Greene	9	55 00	45 00	27	171 00	117 00
Guernsey	18	70 00	42 00	11	40 00	27 00
Hamilton	45	169 00	169 00			
Hancock	13	60 00	42 00	24	108 00	96 00
Hardin	19	27 00	27 00			
Harrison	71	110 00	40 00	91	140 00	56 00
Henry						
Highland	4	24 00	24 00	3	80 00	30 00
Hocking	13	60 00	42 00			
Holmes	7	89 00	31 00	3	65 00	65 00
Huron	8	40 00	40 00	10	25 00	20 00
Jackson						
Jefferson	80	108 00	101 00			
Knox						
Lake						
Lawrence	12	52 00	50 50	4	100 00	100 00
Licking	21	123 00	102 00	18	50 00	50 00
Logan						
Lorain	16	49 50	44 00	16	108 00	108 00
Lucas				40		
Madison						
Mahoning				15	48 00	48 00
Marion	13	29 00	27 00	44	75 00	45 00
Medina	32		32 00	3		20 00
Meigs						
Mercer					45 00	45 00
Miami	9	13 00	13 00	13	56 00	46 00
Monroe	6	24 00	14 40			
Montgomery						
Morgan	23	38 00	26 00	51	25 00	15 00
Morrow	4	5 00	5 00	51	187 00	128 00
Muskingum				13	56 00	28 00
Noble	1	26 00	3 00	8	110 00	110 00
Ottawa	7			2		
Paulding						
Perry	4	29 00	18 00			

TABLE II—Continued.

Counties.	Light harness and saddle.			Sweepstakes.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	55	\$178 00	\$178 00	14	\$100 00	\$100 00
Pike						
Portage						
Preble	17	68 00	60 00	57	54 00	54 00
Putnam	19	18 00	13 00	69	54 00	54 00
Richland	12	29 00	21 00	5	25 00	25 00
Ross	27	132 00	117 00	36	75 00	75 00
Sandusky	25	50 00	50 00	12	50 00	50 00
Scioto	19	80 00	67 00	6	40 00	30 00
Seneca				4	60 00	40 00
Shelby	17	224 00	96 00	15	75 00	75 00
Stark	14	43 00	43 00	88	143 00	143 00
Summit	13	27 00	27 00	31	105 00	105 00
Trumbull				69	42 00	42 00
Tuscarawas	8	36 00	36 00	1	45 00	15 00
Union	3	8 00	8 00	67	142 00	142 00
Van Wert				45	58 00	48 00
Vinton				10	42 00	22 00
Warren	27	84 00	84 00	30	90 00	70 00
Washington				6	20 00	20 00
Wayne				9	25 00	12 00
Williams						
Wood				4		
Wyandot	7	39 00	31 00	10	36 00	36 00
Totals	1,433	\$3,439 50	\$2,767 90	1,398	\$3,901 00	\$3,281 00

TABLE II—Continued.

Counties.	Speed.			Jacks and mules.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams				5	\$11 50	\$7 82
Allen	31	\$1,450 00	\$937 00			
Ashland						
Ashtabula	33	1,360 00	1,012 00			
Athens	10	525 00	525 00	6	27 00	13 00
Auglaize	23	870 00	825 00	5	26 00	11 00
Belmont	17	600 00		2	80 00	
Brown				10	36 00	30 00
Butler	24	1,650 00	1,650 00			
Carroll	22	555 00	532 00	3	13 00	12 00
Champaign	26	447 00	447 00			
Clarke	75	2,075 00	1,675 00	13	61 00	31 00
Clermont	21	350 00	350 00	41	106 00	94 00
Clinton	33	1,305 00	835 00			
Columbiana	30	535 00	535 00	2		
Coshocton	50	1,146 00	1,030 00	2	35 00	7 00
Crawford	25	805 00	457 00	3	35 00	12 00
Cuyahoga	16	475 00	328 00	1	17 50	2 00
Darke	77	2,225 00	1,305 00			
Defiance						
Delaware	23	950 00	826 50	4	25 00	12 00
Erie						
Fairfield	98	3,400 00	3,050 00	5	41 00	23 00
Fayette						
Franklin						
Fulton						
Gallia	6	300 00			35 00	
Geauga	47	975 00	975 00			
Greene	60	788 00	784 00	2	30 00	5 50
Guernsey	17	120 00	53 00		5 00	
Hamilton	64	2,990 00	2,005 00	8	18 00	16 00
Hancock	44	1,475 00	1,450 00		27 00	
Hardin	29	870 00	670 00	14	107 00	47 00
Harrison	20	100 00	40 00			
Henry						
Highland	62	1,300 00	1,300 00			
Hocking	27	1,660 00	1,054 00	2	46 00	8 00
Holmes	34	995 00	839 67	6	21 00	13 00
Huron	69	1,500 00	1,350 00			
Jackson						
Jefferson	29	390 00	390 00			
Knox						
Lake						
Lawrence	16	480 00	125 00	2	52 00	
Licking	25	2,100 00	685 00	1	15 00	10 00
Logan	36	900 00	775 00			
Lorain	32	500 00	585 00			
Lucas	90					
Madison						
Mahoning	21	410 00	293 00			
Marion	28	1,100 00	1,075 00	4	24 00	18 00
Medina	23		745 00	1		2 00
Meigs						
Mercer		1,125 00	1,125 00		22 50	10 00
Miami	97	1,050 00	990 00	3	53 00	15 00
Monroe	23	400 00	275 00		29 00	
Montgomery						
Morgan	14	595 00	340 00	8	20 00	8 00
Morrow	20	800 00	750 00	8	20 00	13 00
Muskingum	17	975 00	475 00			
Noble						
Ottawa	5					
Paulding	50	875 00	467 00	5	22 50	13 00
Perry	10	420 00	251 67			

REPORTS FROM COUNTY SOCIETIES.

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TABLE II—Continued.

Counties.	Speed.			Jacks and mules.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	54	\$2,760 00	\$2,205 00			
Pike						
Portage	37	1,000 00	725 75			
Preble		920 00	920 00	6	\$40 00	\$21 00
Putnam	41	1,530 00	1,230 00	6	40 00	18 00
Richland	28	845 00	725 00			
Ross	101	2,900 00	2,715 00			
Sandusky	50	300 00	200 00			
Scioto	57	1,510 00	1,510 00			
Seneca	28	700 00	700 00	1	2 00	2 00
Shelby	20	443 00	438 00	5	35 00	8 00
Stark	22	395 00	370 00			
Summit	56	2,100 00	1,905 00			
Trumbull	70	600 00	385 00			
Tuscarawas	26	785 00	690 00			
Union	30	1,015 00	875 00			
Van Wert	39	750 00	447 00			
Vinton	38	1,450 00	1,295 00		25 00	
Warren	34	1,000 00	850 00	7	17 00	11 00
Washington	14	230 00	230 00	2	26 00	3 00
Wayne	28	1,000 00	505 00			
Williams						
Wood	25	645 00	645 00	10	16 00	10 00
Wyandot		575 00	290 00			
Totals	2,447	\$69,349 00	\$55,942 59	198	\$1,212 00	\$506 32

TABLE II—Continued.

Counties.	Shorthorns.			Devons.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	7	\$17 00	\$11 58			
Allen	16	71 00	67 00			
Ashland						
Ashtabula	35	52 00	49 00	11	\$52 00	\$40 00
Athens	7	75 00	48 00			
Auglaize						
Belmont	9	145 00				
Brown	12	51 45	45 00			
Butler	83	124 00	116 00			
Carroll	25	88 00	61 00			
Champaign	9	51 00	83 00			
Clarke	25	120 00	106 00	20	70 00	61 00
Clermont	21	85 00	74 00			
Clinton	9	261 00	95 00			
Columbiana	21	54 00	48 00			
Coshocton	24	121 00	102 00	7	100 00	39 00
Crawford	14	82 00	66 00	8	82 00	37 00
Cuyahoga	17	37 50	31 50	15	59 50	14 00
Darke	61	228 00	205 20	14	164 00	107 10
Defiance						
Delaware	23	106 00	84 00		108 00	
Erie						
Fairfield	16	172 00	136 00	2	96 00	9 00
Fayette						
Franklin						
Fulton	19	59 00	39 00		50 00	
Gallia	25	50 00				
Geauga	35	57 00	55 00	18	51 50	33 00
Greene	16	67 00	47 00	11	67 00	41 00
Guernsey	9	66 00	24 00	13	31 00	21 00
Hamilton	25	116 00	107 00		116 00	
Hancock	15	77 00	40 00	12	50 00	33 00
Hardin	9	81 00	37 00			
Harrison	18	114 00	40 00			
Henry						
Highland	16	117 00	117 00			
Hocking	8	78 00	47 00			
Holmes	22	67 50	58 50			
Huron	34	68 00	68 00			
Jackson						
Jefferson	10	54 00	27 00			
Knox						
Lake						
Lawrence		89 00				
Licking	1	15 00	10 00	23	157 00	143 00
Logan	37	106 00	88 50			
Lorain	18	76 50	65 50			
Lucas	29			20		
Madison	16	84 00	69 00			
Maboning	13	79 00	55 00		79 00	
Marion	12		40 50			
Medina						
Meigs						
Mercer		100 00	96 00		100 00	
Miami	15	62 00	48 00	23	57 00	52 00
Monroe	4	46 00	11 40		46 00	
Montgomery						
Morgan		40 00				
Morrow	31	126 00	109 00		92 00	
Muskingum	10	81 00	45 00	18	81 00	66 00
Noble	15	82 50	54 00			
Ottawa						
Paulding	6	68 00	20 00			
Perry	17	46 00	35 00	8	46 00	24 00

TABLE II—Continued.

Counties.	Shorthorns.			Devons.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	14	\$124 00	\$89 00			
Pike	9	60 00	38 50	10	\$60 00	\$37 50
Portage	26	102 00	82 00	8	60 00	37 00
Preble	14	94 00	62 00	4	94 00	30 00
Putnam	23	64 00	49 00		64 00	
Richland	27	130 00	125 00			
Ross	55	80 00	80 00			
Sandusky	9	3 00	47 00			
Scioto	17	70 00	58 00	5	70 00	27 00
Seneca	51	93 00	80 00	23	93 00	52 00
Shelby	36	174 00	156 00			
Stark	20	69 00	62 00	8	69 00	35 00
Summit	26	78 00	101 00	2	78 00	16 00
Trumbull	9	78 00	47 00			
Tuscarawas	22	88 00	77 00			
Union	22	79 00	79 00			
Van Wert	21	67 00	46 00			
Vinton	10	71 00	33 00		40 00	
Warren	20	56 00	40 00	24	56 00	45 00
Washington	13	64 00	25 20			
Wayne						
Williams	2	36 00	17 00	2	36 00	6 00
Wood	26	170 00	170 00			
Wyandot						
Totals	1,342	\$5,961 45	\$4,393 36	309	\$2,475 00	\$1,005 10

TABLE II—Continued.

Counties.	Herfords.			Holsteins.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams				8	\$33 00	\$35 00
Allen						
Ashland				21	52 00	49 00
Ashtabula	14	\$52 00	\$38 00			
Athens						
Auglaize				23	87 00	
Belmont		51 00		1	51 00	8 00
Brown		108 00	63 00	24	104 00	92 00
Butler	7			9	50 00	27 00
Carroll				6	45 00	20 00
Champaign		70 00		16	70 00	34 00
Clarke						
Clermont						
Clinton						
Columbiana				10	54 00	42 50
Coshocton					40 00	
Crawford	6	82 00	33 00		82 00	
Cuyahoga	12	34 50	21 00	1	37 50	3 00
Darke	3	164 00	28 00	20	164 00	128 00
Defiance						
Delaware				14	108 00	66 00
Erie						
Fairfield				21	96 00	94 00
Fayette						
Franklin						
Fulton	3	50 00	9 00	7	50 00	23 00
Gallia						
Geauga	16	51 50	37 00	13	51 50	30 00
Greene	6	67 00	34 00	6	67 00	29 00
Guernsey				7	31 00	14 00
Hamilton		116 00		25	116 00	82 00
Hancock					73 00	
Hardin	5	81 00	22 00	11	81 00	42 00
Harrison						
Henry						
Highland						
Hocking				4	78 00	18 00
Holmes				11	67 50	47 50
Huron	13	68 00	59 00	12	68 00	50 00
Jackson						
Jefferson				15	39 50	31 50
Knox						
Lake					89 00	
Lawrence						
Licking	7	68 00	24 00	1	51 00	10 00
Logan	10	100 50	44 00	8	100 50	34 50
Lorain	11	76 50	62 00	12	76 50	46 00
Lucas	86			8		
Madison						
Mahoning	13	84 00	66 00	11	84 00	51 00
Marion	1	79 00	6 00	7	72 00	45 00
Medina				1		10 00
Meigs						
Mercer		100 00			100 00	89 00
Miami	6	56 00	24 00	7	56 00	20 00
Monroe					46 00	
Montgomery						
Morgan		36 00		15	32 00	21 00
Morrow				5		34 00
Muskingum						
Noble						
Ottawa						
Paulding	12	68 00	41 00	3	18 00	10 00
Perry						

TABLE II—Continued.

Counties.	Herfords.			Holsteins.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway				15	\$84 00	\$72 00
Pike	8	\$60 00	\$33 00	9	60 00	34 00
Portage	3	102 00	82 00	21	102 00	85 00
Preble		94 00		20	94 00	68 00
Putnam	12	64 00	51 00	19	64 00	34 00
Richland		77 00		12	77 00	62 00
Ross	10	80 00	50 00		80 00	
Sandusky				13	70 00	52 00
Scioto		93 00		7	93 00	37 00
Seneca	11	44 00	44 00	25	133 00	115 00
Shelby	14	69 00	59 00	13	69 00	50 00
Stark	21	78 00	70 00	27	78 00	50 00
Summit				4	26 00	22 00
Trumbull				17	75 00	40 00
Tuscarawas				1	57 00	10 00
Union					67 00	
Van Wert		40 00		9	60 00	46 00
Vinton	1	56 00	3 00	10	56 00	37 00
Warren	8	64 00	27 80	8	64 00	21 60
Washington				5	36 00	14 00
Wayne		36 00		1	64 00	4 00
Williams						
Wood						
Wyandot						
Totals	320	\$2,650 00	\$975 80	604	\$4,058 00	\$2,089 60

TABLE II—Continued.

Counties.	Jerseys.			Polled Breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	12	\$30 00	\$20 40			
Allen	12	63 00	49 00	2		\$8 00
Ashland						
Ashtabula	11	52 00	34 00			
Athens						
Auglaize						
Belmont	6	85 00		2	\$87 00	
Brown	14	51 00	51 00		51 00	
Butler	18	81 00	69 00	17	104 00	90 00
Carroll	6	38 00	16 00			
Champaign	20	51 00	42 00	10	56 00	26 00
Clarke	18	70 00	60 00	34	140 00	84 00
Clermont	27	85 00	79 00			
Clinton	14	104 00	74 00			
Columbiana	12	54 00	32 50	1	8 00	8 00
Coshocton	2	37 00	13 00			
Crawford				7	57 00	26 00
Cuyahoga	10	34 50	17 50	6	34 50	2 00
Darke	8	132 00	64 80		164 80	
Defiance						
Delaware	22	107 00	95 00	2	108 00	14 00
Erie						
Fairfield	16	96 00	77 00		96 00	
Fayette						
Franklin						
Fulton	12	50 00	35 00	3	50 00	12 00
Gallia	20	50 00				
Geauga	19	51 50	33 00			
Greene	15	67 00	53 00	17	67 00	56 00
Guernsey	9	31 00	18 00			
Hamilton	36	116 00	96 00			
Hancock	8	50 00	19 00			
Hardin	8	81 00	29 00	9	81 00	36 00
Harrison	12	36 00	4 89	4	38 00	2 40
Henry						
Highland						
Hocking						
Holmes	13	67 50	36 50			
Huron	23	68 00	68 00		68 00	
Jackson						
Jefferson	15	39 50	36 50			
Knox						
Lake						
Lawrence	14	89 00	54 00			
Licking				13	49 00	35 00
Logan	23	48 50	73 50	7	100 50	26 50
Lorain	10	76 50	49 50			
Lucas	19					
Madison						
Mahoning	31	84 00	84 00	12	84 00	41 00
Marion	18	79 00	55 00			
Medina	19		52 00	5		15 00
Meigs						
Mercer		100 00	10 00			
Miami	18	57 00	43 00	19	57 00	47 00
Monroe	4	46 00	7 20			
Montgomery						
Morgan	7	22 00	16 00			
Morrow	25	126 00	98 00			
Muskingum	10	64 00	48 00	4	81 00	29 00
Noble						
Ottawa	2	110 00	8 50			
Paulding	3	68 00	8 00			
Perry	6	46 00	23 00			

TABLE II—Continued.

Counties.	Jerseys.			Polled Breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	8	\$80 00	\$48 00			
Pike	19	60 00	51 00		\$60 00	
Portage	12	66 00	45 00	6	102 00	\$42 00
Preble	3	59 00	12 00			
Putnam	10	64 00	48 00	1	64 00	6 00
Richland	1	77 00	6 00	10	77 00	54 00
Ross	30	80 00	60 00	3	80 00	30 00
Sandusky	17	56 00	46 00			
Scioto	23	70 00	56 00			
Seneca	15	93 00	66 00		93 00	
Shelby	45	133 00	127 00	1		5 00
Stark	10	69 00	45 00		69 00	
Summit	33	78 00	71 00			
Trumbull	3	26 00	21 00			
Tuscarawas	31	75 00	75 00	13	75 00	46 00
Union	7	57 00	37 00	3	25 00	25 00
Van Wert	2	67 00	9 00			
Vinton	14	38 00	25 00			
Warren	13	24 00	22 00			
Washington	8	64 00	22 20	1	64 00	4 80
Wayne						
Williams	6	36 00	11 00		36 00	
Wood	7	64 00	27 00			
Wyandot						
Totals	949	\$4,470 00	\$2,785 79	212	\$2,324 00	\$760 70

TABLE II—Continued.

Counties.	Ayrshires.			All other Breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams						
Allen				4	\$61 00	\$19 00
Ashland						
Ashtabula	30	\$52 00	\$34 00	39	99 00	56 00
Athens				9	48 00	25 00
Auglaize				17	52 00	38 00
Belmont				12	49 00	
Brown				15	52 00	39 00
Butler				22	161 00	126 00
Carroll				26	57 00	42 00
Champaign						
Clarke		70 00		2	68 00	30 00
Clermont						
Clinton						
Columbiana				10	53 00	23 00
Cochocton				13	68 00	48 00
Crawford				4	34 00	24 00
Cuyahoga		34 50		12	34 00	24 50
Darke					60 00	54 00
Defiance						
Delaware				15	90 00	36 00
Erie						
Fairfield						
Fayette						
Franklin						
Fulton	15	50 00	21 00			
Gallia				5	55 00	
Geauga	17	51 50	32 00	66	155 00	57 00
Greene						
Guernsey				10	59 00	28 00
Hamilton						
Hancock				17	38 00	30 00
Hardin				12	48 00	25 00
Harrison						
Henry						
Highland						
Hocking				21	149 00	62 00
Holmes				12	20 00	20 00
Huron				9	48 00	42 00
Jackson						
Jefferson				12	59 00	22 50
Knox						
Lake						
Lawrence				2	48 00	19 00
Licking						
Logan	5	100 50	10 00	7	86 00	27 00
Lorain	43	76 50	74 00	6	85 00	24 00
Lucas	13			7		
Madison						
Mahoning				89	102 00	82 00
Marion	1	25 00	15 00	7	177 00	32 00
Medina	7		28 00	85		78 50
Meigs						
Mercer						
Miami	4	57 00	20 00			
Monroe				10	76 00	22 80
Montgomery						
Morgan	4	36 00	9 00			
Morrow				20	65 00	
Muskingum						
Noble				2	34 50	12 00
Ottawa				3		
Paulding				7	49 00	8 50
Perry						

TABLE II—Continued.

Counties.	Ayreshires.			Any other Breeds.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway						
Pike	19	\$60 00	\$43 50	19	\$114 00	\$53 50
Portage				13	152 00	80 00
Preble				15	89 00	51 00
Putnam				4	20 00	6 00
Richland						
Ross				40	200 00	200 00
Sandusky				15	76 00	55 00
Scioto		69 00		8	56 00	39 00
Seneca		93 00		11	47 00	16 00
Shelby				14	104 00	60 00
Stark	31	69 00	69 00	14	77 00	55 00
Summit				28	101 00	52 00
Trumbull				5	33 00	18 00
Tuscarawas						
Union				4	114 00	20 00
Van Wert				2	52 00	7 00
Vinton						
Warren				22	55 00	33 00
Washington				11	38 00	15 60
Wayne						
Williams		36 00		6	36 00	13 00
Wood				1	46 00	5 00
Wyandot						
Totals	189	\$880 00	\$355 50	741	\$3,697 50	\$1,950 90

TABLE II—Continued.

Counties.	Sweepstakes.			Sheep—All classes.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams				4	\$8 00	\$5 44
Allen	8	\$16 00	\$16 00	44	88 00	78 00
Ashland						
Ashtabula	36	78 00	66 00	89	122 00	120 00
Athens	5	39 00	39 00	51	216 00	211 00
Auglaize	4	10 00	10 00	66	109 00	87 50
Belmont	2	14 00		21	205 00	
Brown				74	170 00	168 00
Butler	31	45 00	45 00	90	208 00	181 00
Carroll	4	18 00	18 00	105	286 00	280 00
Champaign	20	56 00	50 00	81	99 00	94 00
Clarke	50	418 00	285 00	168	318 00	262 00
Clermont				73	108 00	60 00
Clinton				21	63 00	31 50
Columbiana	10	24 00	24 00	101	249 00	231 00
Coshocton	7	60 00	60 00	78	295 00	218 00
Crawford	23	83 00	83 00	79	352 00	122 00
Cuyahoga	7	11 00	11 00	48	91 50	58 00
Darke	16	225 00	175 00	218	292 00	266 80
Defiance						
Delaware	9	90 00	90 00	98	341 00	297 00
Eric						
Fairfield	18	207 00	160 00	95	480 00	463 00
Fayette						
Franklin						
Fulton				53	73 00	65 00
Gallia	5	30 00		25	70 00	
Geauga	32	53 00	53 00	109	132 00	110 50
Greene	16	260 00	190 00	73	179 00	170 00
Guernsey	7	19 00	14 00	39	106 00	61 00
Hamilton				98	156 00	129 00
Hancock	4	48 00	42 00	75	166 00	109 00
Hardin	5	40 00	40 00	55	155 00	68 00
Harrison				81	290 00	109 00
Henry						
Highland	6	90 00	90 00	29	124 00	124 00
Hocking	3	24 00	16 00	13	120 00	33 00
Holmes	7	20 00	20 00	88	206 00	152 00
Huron	23	26 00	26 00	103	200 00	190 00
Jackson						
Jefferson	8	60 00	56 00	95	218 00	213 00
Knox						
Lake						
Lawrence	3	25 00	10 00	8	98 00	
Licking	16	83 00	83 00	94	395 00	369 00
Logan	10	45 00	30 00	97	456 00	125 00
Lorain				51	143 00	74 00
Lucas	63			130		
Madison						
Mahoning	23	63 00	63 00	129	221 00	186 00
Marion	11	70 00	70 00	90	287 00	144 00
Medina	8		54 00	97		150 00
Meigs						
Mercer		115 00	115 00		105 00	85 00
Miami	13	65 00	65 00	87	198 00	170 00
Monroe				36	111 00	56 40
Montgomery						
Morgan	12	29 00	29 00	40	104 00	72 00
Morrow	29	134 00	162 80	86	224 00	109 00
Muskingum	19	95 00	95 00	66	243 00	131 00
Noble				18	114 00	75 00
Ottawa				47	44 50	53 00
Paulding	5	37 00	30 00	30	132 50	48 50
Perry	18	40 00	39 00	17	74 00	51 00

TABLE II—Continued.

Counties.	Sweepstakes.			Sheep—All classes.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	14	\$250 00	\$180 00	27	\$158 00	\$109 00
Pike						
Portage				58	239 00	164 50
Preble				137	190 00	175 00
Putnam	17	102 00	90 00	39	125 00	103 00
Richland	29	56 00	56 00	73	168 00	165 00
Ross	19	200 00	200 00	17	127 00	74 00
Sandusky	7	16 00	16 00	140	300 00	300 00
Scioto	11	60 00	60 00			
Seneca	4	20 00	20 00	63	105 00	93 00
Shelby	3	25 00		93	179 00	158 00
Stark	15	105 00	90 00	132	477 00	449 00
Summit	28	300 00	300 00	106	313 00	288 00
Trumbull	29	41 00	41 00	71	137 00	108 00
Tuscarawas	3	175 00	50 00	29	216 00	122 00
Union	36	155 00	155 00	101	235 00	214 00
Van Wert	11	24 00	34 00	63	266 00	192 00
Vinton	10	20 00	20 00	9	66 00	31 00
Warren	7	160 00	160 00	55	136 00	103 00
Washington	46	22 00	22 00	38	184 00	79 00
Wayne	15	72 00	57 60	62	135 00	66 30
Williams						
Wood				32	50 00	33 00
Wyandot	6	36 00	36 00	40	186 00	172 00
Totals	855	\$4,444 00	\$4,011 60	5,033	\$13,145 50	\$9,818 44

TABLE II—Continued.

Counties.	Swine—All classes.			Poultry.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	16	\$15 00	\$10 20	25	\$5 50	\$8 75
Allen	51	327 00	101 00	96	101 00	41 00
Ashland	49	162 00	106 00	192	79 00	44 00
Ashtabula	32	52 00	27 00	40	62 50	32 50
Athens	46	179 00	96 00	58	50 00	21 50
Auglaize	15	76 00		1	123 00	
Belmont	40	221 00	101 00	38	72 00	24 50
Brown	178	391 00	369 00	314	188 00	160 00
Butler	53	103 00	87 00	58	48 50	40 50
Carroll	57	142 00	106 00	51	98 25	18 00
Champaign	106	317 00	260 00	170	365 00	139 00
Clarke	53	160 00	139 00	11	41 00	5 00
Clermont	26	147 00	130 50	8	37 00	4 00
Clinton	42	148 00	112 00	150	72 00	65 00
Columbiana	39	151 00	87 00	11	76 00	6 00
Coshocton	60	232 00	134 00	.85	121 00	59 00
Crawford	31	71 50	40 00	61	40 00	20 25
Cuyahoga	156	518 00	469 20	58	98 00	21 90
Darke						
Defiance	56	168 00	151 00	91	80 00	47 00
Delaware						
Erie	67	292 00	256 00	236	173 00	146 00
Fairfield						
Fayette						
Franklin	30	64 00	33 00	59	30 00	17 00
Fulton	24	60 00		15	20 00	
Gallia	87	135 00	95 00	338	53 00	53 00
Geauga	40	110 00	107 00	14	96 00	11 00
Greene	23	57 00	46 00	15	42 00	2 50
Guernsey	69	309 00	247 00	45	72 00	26 00
Hamilton	30	110 00	74 00	120	82 00	82 00
Hancock	110	208 00	125 00	39	69 00	30 00
Hardin	42	84 00	20 20	25	25 00	10 00
Harrison						
Henry	18	89 00	89 00	45	100 00	39 50
Highland	18	374 50	66 00	7	55 50	6 50
Hocking	53	158 00	108 00	100	109 00	60 23
Holmes	18	170 00	143 00	236	60 00	56 00
Huron						
Jackson	21	75 00	63 00	40	35 00	15 00
Jefferson						
Johnson						
Knox						
Lake	17	107 00	50 00	17	66 00	
Licking	24	5 00	50 00	284	325 00	152 00
Lincoln	8	23 00	18 00	68	63 00	28 50
Lorain	1	135 00	70 00	200	85 50	85 50
Lucas	126			207		
Madison						
Mahoning	78	131 00	115 00	255	86 25	69 50
Manitowish	43	246 00	76 00	167	353 25	88 00
Marion	76		120 50	235		138 75
Meigs						
Merger		175 00	170 00		67 50	40 50
Miami	98	290 00	212 00	63	67 50	49 00
Monroe	25	140 00	43 80	4	45 00	90
Montgomery						
Morgan	33	63 00	60 00	73	56 00	19 00
Morrow	73	194 00	163 00	106	210 00	71 50
Muskingum	27	134 00	120 00	67	130 50	56 00
Noble				1	22 50	50
Ottawa	2	59 25	4 00	8	34 00	8 00
Paulding	14	150 00	25 50	42	70 00	33 00
Perry	11	50 00	38 50	53	42 75	18 75

TABLE II—Continued.

Counties.	Swine—All classes.			Poultry.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	18	\$126 00	\$78 00	85	\$100 00	\$93 00
Pike						
Portage	19	165 00	59 00	147	87 00	53 00
Preble	129	275 00	215 00	210	81 00	78 00
Putnam	60	205 00	185 00	126	98 00	71 50
Richland	40	231 00	136 00	88	87 50	53 50
Ross	45	168 00	148 00	128	104 00	80 00
Sandusky	54	200 00	160 00	272	200 00	150 00
Scioto	4	31 00	10 00	15	90 00	16 00
Seneca	35	146 00	115 00	55	124 50	12 50
Shelby	54	236 00	134 00	53	181 00	50 25
Stark	100	330 00	302 00	213	220 00	142 00
Summit	90	166 50	138 00	233	136 00	84 00
Trumbull	39	107 00	68 00	137	51 25	41 75
Tuscarawas	51	188 00	122 00	50	49 50	23 00
Union	59	192 00	144 00	241	122 00	93 00
Van Wert	29	288 00	98 00	51	108 00	50 00
Vinton	14	94 00	35 00	5	16 00	3 00
Warren	46	156 00	100 00	102	120 00	55 00
Washington	19	121 00	43 00	40	54 00	10 25
Wayne	18	122 00	36 20	50	103 00	24 90
Williams						
Wood	34	63 00	59 00	40	37 00	13 00
Wyandot	77	164 00	140 00	172	500 00	145 00
Totals	3,912	\$12,335 75	\$8,438 60	7,243	\$7,173 75	\$3,519 08

TABLE II—Continued.

Counties.	Farm products.			Fruits.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	256	\$33 00	\$56 44	25	\$2 50	\$1 70
Allen	597	126 00	106 00	37	14 00	19 00
Ashland						
Ashtabula	1,147	228 00	180 00	305	145 00	55 00
Athens	46	40 25	17 75	37	17 00	16 50
Auglaise	675	104 00	104 50	42	18 50	18 50
Belmont	322	199 00		96	128 00	
Brown	744	204 00	136 50	266	36 50	27 50
Butler	1,154	292 00	284 00	372	71 00	68 00
Carroll	408	117 00	112 50	293	24 50	24 00
Champaign	682	140 50	127 50	223	30 50	26 50
Clarke	815	560 00	283 00	370	177 00	132 00
Clermont	866	138 00	126 00	760	118 00	117 00
Clinton	236	100 00	91 00	57	56 00	42 00
Columbiana	536	78 00	78 00	394	185 00	185 00
Coshooton	285	125 00	106 00	45	50 00	37 00
Crawford	332	225 80	139 70	109	78 00	33 00
Quyahoga	399	105 25	82 25	112	23 25	17 00
Darke	708	135 00	124 00	274	78 00	60 00
Defiance						
Delaware	989	232 50	222 00	264	62 00	61 50
Erie						
Fairfield	353	359 50	305 00	258	165 50	154 00
Fayette						
Franklin						
Fulton	276	135 00	83 00	93	25 00	22 00
Gallia	100	80 00	18 00	35	25 00	
Geauga	820	154 25	128 25	296	41 00	38 00
Greene	926	216 25	190 00	195	27 00	14 00
Guernsey	275	215 00	66 50	165	60 00	23 00
Hamilton	374	174 00	169 00	122	85 00	71 50
Hancock	794	195 00	161 00	18	20 00	17 00
Hardin	697	156 00	128 50	85	14 50	14 50
Harrison	521	103 00	30 00	150	42 00	6 11
Henry						
Highland	63	67 75	46 25	15	15 50	15 50
Hocking	104	88 75	36 25	85	34 00	11 00
Holmes	360	127 40	70 15	282	49 70	28 62
Huron	842	110 00	104 00	122	60 00	52 00
Jackson						
Jefferson	575	125 00	99 25	150	30 00	24 00
Knox						
Lake						
Lawrence	352	165 00	105 00	226	100 00	87 00
Licking	780	270 00	246 00	401	97 50	93 50
Logan	1,705	350 00	344 25	211	49 50	36 75
Lorain	446	186 55	136 85	196	143 85	143 85
Lucas	775			239		
Madison						
Mahoning	596	229 50	156 50	142	\$39 75	33 00
Marion	769	214 50	168 25	214	34 75	28 75
Medina	387		96 25	961		14 75
Melgs						
Mercer		67 00	67 00		25 00	25 00
Miami	584	217 00	196 00	348	98 00	83 00
Monroe	70	30 00	4 50	120	15 00	6 30
Montgomery						
Morgan	243	83 00	68 00	40	20 00	20 00
Morrow	846	133 25	123 50	369	56 95	19 00
Muskingum	58	101 75	58 50	169	217 00	101 00
Noble	13	56 25	11 25	7	18 00	10 00
Ottawa	295	117 50	86 70	143	62 25	47 50
Paulding	288	184 00	62 00	248	69 00	33 00
Perry	138	102 00	60 25	62	51 00	\$17 75

TABLE II—Continued.

Counties.	Farm products.			Fruits.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	107	189 00	\$77 00	\$119	\$105 00	\$50 00
Pike	1,034	187 50	145 00	278	65 00	36 50
Portage	813	151 00	140 00	148	21 00	21 00
Preble	765	187 00	115 00	73	22 00	17 25
Putnam	107	121 00	69 50	82	35 00	30 00
Richland	104	195 00	167 00	283	148 00	116 00
Ross	780	130 00	130 00	203	50 00	50 00
Sandusky	98	91 00	43 00	90	35 00	25 00
Seneca	502	130 75	129 25	183	63 00	57 25
Shelby	827	135 50	123 00	127	51 75	40 00
Stark	924	370 00	322 00	685	175 00	147 00
Summit	869	369 00	291 00	426	213 00	101 00
Trumbull	462	109 50	112 50	392	95 00	42 25
Tuscarawas	468	174 25	154 00	219	61 00	60 00
Union	301	216 50	151 00	60	25 00	25 00
Van Wert	811	181 00	181 00	217	62 00	62 00
Vinton	35	82 00	25 00	10	15 00	5 00
Warren	397	250 00	157 00	270	135 00	78 00
Washington	120	245 80	25 95	60	23 15	14 95
Wayne	322	138 00	65 70	59	46 50	19 20
Williams						
Wood	317	80 00	50 00	169	45 00	37 00
Wyandot	371	95 00	102 00	39	24 50	18 50
Totals	36,656	\$11,877 30	\$8,789 29	13,043	\$7,509 40	\$,285 48

TABLE II—Continued.

Counties.	Flowers.			Machinery and manufacturers' product.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams				27	\$18 25	\$9 01
Allen		\$14 00		165	48 00	85 00
Ashland						
Ashtabula	273	108 00	\$84 00			
Athens	4	4 50	3 50	28	118 25	\$34 00
Auglaize	29	20 00	22 50	26	71 00	55 00
Belmont	37	35 00		11	231 00	
Brown	419	90 00	87 00	90	138 00	103 50
Butler	174	197 00	174 00			
Carroll	38	17 00	16 50	45	121 00	70 00
Champaign	28	40 00	40 00	10	31 00	19 00
Clarke	16f	156 00	135 00	60	25 00	5 00
Clermont	320	94 00	93 00	106	138 00	109 00
Clinton	10	96 00	82 00	8	79 00	12 50
Columbiana	112	62 00	62 00	62	109 00	56 50
Coshocton	85	55 00	26 00	150	140 00	73 00
Crawford	54	92 00	59 00	43	114 00	82 95
Cuyahoga	86	38 00	24 50	108	104 00	61 75
Darke	123	85 00	62 30	280	546 00	427 08
Defiance						
Delaware	28	37 50	27 50	74	81 00	67 00
Erie						
Fairfield	137	210 00	199 00		15 00	
Fayette						
Franklin						
Fulton	41	40 00	11 00	40	80 00	22 00
Gallia	22	20 00	18 00	29	66 00	
Geauga	229	52 50	39 75	66	53 25	41 00
Greene	25	35 00	26 50			
Guernsey	60	35 00	19 50	35	50 00	12 00
Hamilton	19	80 00	70 00	8	43 00	25 00
Hancock	6	12 00	12 00	74	110 00	41 00
Hardin	48	45 00	36 00	127	140 00	54 00
Harrison	30	28 00	11 00	82	150 00	40 00
Henry						
Highland	34	55 00	32 00	5	79 15	8 00
Hocking	35	35 50	23 25	18	125 30	15 00
Holmes	40	38 75	25 13	78	168 00	50 63
Huron	24	120 00	78 00	69	128 00	92 00
Jackson						
Jefferson	105	47 00	26 00	50	104 00	38 50
Knox						
Lake						
Lawrence	1	17 00		9	130 00	20 00
Licking	19	48 00	29 00	66	305 00	96 00
Logan	151	128 50	113 75	81	127 00	16 00
Lorain	50	23 85	23 75	102	194 00	113 00
Lucas	97			564		
Madison						
Mahoning	214	108 00	90 25	52	162 75	53 50
Marion	42	56 50	48 00	182	309 50	251 00
Medina	108		27 75	36		48 50
Meigs						
Mercer		22 75	20 00		47 00	30 00
Miami	5	26 00	29 00	68		
Monroe	310	50 00	24 30	72	10 00	4 30
Montgomery						
Morgan	2	16 00	2 00	53	79 00	42 50
Morrow	92	50 00	20 50	15	98 50	40 00
Muskingum				23	162 00	52 00
Noble	4	7 50	8 00	7	57 00	12 00
Ottawa	38	24 25	12 50	33	68 00	32 00
Paulding	28	134 00	36 00	60	14 00	14 00
Perry	29	39 75	17 00	4	11 00	5 00

TABLE II—Continued.

Counties.	Flowers.			Machinery and manufacturers' product.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	47	\$125 00	\$67 00	12	\$165 00	\$79 00
Pike	125	81 00	65 00	52	97 00	54 25
Portage	189	75 00	70 00	150	135 00	100 00
Preble	22	23 00	23 00	110	89 00	56 00
Putnam	13	22 50	12 00			
Richland	52	106 00	65 00	25	190 00	130 00
Ross	40	45 00	45 00	336	168 00	168 00
Sandusky	5	70 50	9 00	29	85 00	44 00
Scioto	44	91 75	45 75			
Seneca	51	27 50	22 00	97	182 50	83 00
Shelby	73	110 00	86 00	561	192 00	134 00
Stark	128	209 50	150 00	528	205 00	145 00
Summit	66	45 75	37 00	60	149 25	64 00
Trumbull	44	71 00	51 00	61	107 50	64 75
Tuscarawas	122	97 00	96 00	120	183 55	165 50
Union	11	15 00	8 00	32	56 00	38 00
Van Wert	5	10 00	3 00	10	43 00	16 00
Vinton	52	79 00	33 00	60	295 00	208 00
Warren	14	29 00	10 80	18	48 00	20 00
Washington	22	40 00	14 70	160	48 00	21 00
Wayne						
Williams						
Wood	116	75 00	71 00	51	25 00	15 00
Wyandot	36	36 00	31 00	72	13 00	13 00
Totals	\$5,416	\$4,299 25	\$3,124 48	5,947	\$7,664 70	\$4,114 09

TABLE II—Continued.

Counties.	Fine arts.			Textile fabrics and domestic manufactures.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Adams	21	\$2 00	\$1 36	61	\$14 00	\$9 52
Allen	102	36 00	55 00	344	182 00	144 00
Ashland						
Ashtabula	189	123 00	95 00	315	139 00	100 00
Athens						
Auglaize	24	19 50	19 50	391	131 50	143 00
Belmont	24	54 00		194	126 00	
Brown	13	8 00	5 00	291	75 50	60 50
Butler	136	73 00	68 00	1,019	386 00	388 00
Carroll	38	24 00	21 00	269	98 50	90 00
Champaign	52	31 00	25 00	181	122 75	77 25
Clarke	70	176 00	75 00	210	240 00	90 00
Clermont	46	49 00	44 00	321	106 00	75 00
Clinton	1	23 00	. 50	115	90 50	53 50
Columbiana	74	83 00	27 50	136	105 00	102 00
Coshocton	98	60 00	43 00			
Crawford	82	118 00	72 00	406	160 00	151 50
Cuyahoga	60	37 50	28 50	101	72 00	54 00
Darke	60	72 00	48 60	607	444 00	328 00
Defiance						
Delaware	94	74 00	47 00	254	143 50	116 00
Erie						
Fairfield	374	557 00	482 00	122	152 50	129 00
Fayette						
Franklin						
Fulton	43	44 00	25 00	170	101 00	61 00
Gallia	8	25 00	13 00	106	75 00	46 00
Geauga	93	27 50	15 00	475	90 75	86 00
Greene	39	42 00	24 00	610	130 25	114 00
Guernsey	12	32 60	6 50	317	175 00	53 25
Hamilton	208	145 00	138 00	152	85 00	78 00
Hancock	35	16 00	14 00	72	47 00	30 00
Hardin	23	27 00	13 50	67	98 50	37 50
Harrison	58	60 00	24 00	750	164 00	47 60
Henry						
Highland	75	100 00	60 50	36	41 25	25 00
Hocking	113	151 96	56 80	12	35 75	13 00
Holmes	28	31 00	12 75	189	120 50	68 65
Huron	84	200 00	135 50	501	75 00	40 00
Jackson						
Jefferson	20	24 00	8 60	180	108 90	44 20
Knox						
Lake						
Lawrence	58	88 00	12 00	20	71 00	23 00
Licking	132	105 00	70 00	315	241 00	211 00
Logan	158	86 00	112 00	565	178 50	264 75
Lorain	108	45 75	27 00	148	98 70	77 96
Lucas	635			1,226		
Madison						
Mahoning	113	117 00	76 75	175	83 25	51 75
Marion	248	101 50	82 75	722	381 25	288 00
Medina	100		88 25	383		146 20
Meigs						
Mercer		125 00	105 25		358 00	110 60
Miami	86	140 00	74 00	533	266 00	247 00
Monroe	35	8 00	8 30	200	28 00	11 50
Montgomery						
Morgan	106	54 00	48 50	142	84 00	60 00
Morrow	144	80 75	75 75	424	182 75	76 75
Muskingum	23	162 00	52 00	4	32 50	10 00
Noble						
Ottawa	53	37 25	16 75	122	113 00	39 25
Paulding	126	65 00	34 00	210	111 00	46 00
Perry	8	26 00	7 50	79	48 50	42 25

TABLE II—Continued.

Counties.	Fine arts.			Textile fabrics and domestic manufactures.		
	Number of entries.	Amount offered.	Amount awarded.	Number of entries.	Amount offered.	Amount awarded.
Pickaway	110	\$232 00	\$151 00	156	\$187 00	\$135 00
Pike						
Portage	67	40 25	22 00	102	78 25	36 50
Preble	220	75 00	75 00	300	110 00	90 00
Putnam	180	75 00	42 50	53	15 00	12 50
Richland	56	75 00	40 00	136	102 00	81 00
Ross				407	480 00	385 00
Sandusky	150	130 00	130 00	1,105	421 50	421 50
Scioto	43	52 00	41 00	109	150 00	100 00
Seneca	143	64 50	37 50	422	179 75	117 25
Shelby	113	84 50	68 00	220	124 50	71 00
Stark	129	202 00	166 00	238	348 00	280 00
Summit	45	135 00	75 00	162	139 00	57 00
Trumbull	109	56 50	43 00	340	90 50	96 25
Tuscarawas	40	75 50	39 00	57	116 00	58 50
Union	74	59 00	39 00	304	191 50	150 00
Van Wert	26	33 00	19 00	309	125 00	110 00
Vinton	77	42 00	22 00	13	11 00	4 00
Warren	117	154 00	112 00	108	195 00	76 00
Washington	27	85 50	81 25	128	198 90	49 55
Wayne	58	66 00	17 40	206	136 00	54 20
Williams						
Wood	37	25 00	20 00	68	30 00	25 00
Wyandot	86	28 75	23 00	303	111 00	97 25
Totals	6,437	\$5,481 20	\$3,749 56	19,983	\$9,926 00	\$7,031 97

TABLE II—Continued.

Counties.	Non-enumerated.		
	Number of entries.	Amount offered.	Amount awarded.
Adams	15	\$21 37	\$21 3
Allen			
Ashland			
Ashtabula	14	63 00	9 00
Athens	66		11 00
Auglaize			
Belmont	9		
Brown	47		52 75
Butler			
Carroll	272		38 50
Champaign	24	50 00	50 00
Clarke	15		
Clermont	89		43 00
Clinton	102		
Columbiana	120		48 00
Coshocton	320		90 00
Crawford	12	100 00	12 00
Cuyahoga	30	31 25	24 50
Darke	86	185 00	162 23
Defiance			
Delaware	14	79 00	40 00
Erie			
Fairfield			
Fayette			
Franklin			
Fulton	220	45 00	31 00
Gallia	85	65 00	
Geauga	57		64 00
Greene			
Guernsey	27	185 00	119 00
Hamilton	30	125 00	125 00
Hancock	180	144 00	73 00
Hardin	108		25 00
Harrison	100		18 19
Henry			
Highland			
Hocking	1	12 50	1 00
Holmes	198	58 50	23 22
Huron	33		36 00
Jackson			
Jefferson	60		14 90
Knox			
Lake			
Lawrence	32	27 50	
Licking	2	140 00	5 00
Logan	56		12 00
Lorain			
Lucas	452		
Madison			
Mahoning	56	50 00	7 00
Marion	258	51 50	114 25
Medina			
Meigs			
Mercer		250 00	79 15
Miami	10	3 50	3 50
Monroe	350		57 00
Montgomery			
Morgan	114	98 00	29 00
Morrow	28	23 00	21 00
Muskingum	57	86 00	35 75
Noble	19	9 80	9 80
Ottawa			
Paulding			
Perry	11	18 50	10 00

TABLE II—Continued.

Counties.	Non-enumerated.		
	Number of entries.	Amount offered.	Amount awarded.
Pickaway			
Pike			
Portage	2	\$64 00	\$6 00
Preble			50 00
Putnam	229	17 00	80 70
Richland	13	80 00	19 00
Ross	67	71 00	35 50
Sandusky	500		
Scioto			
Seneca	46	27 00	12 50
Shelby			
Stark	348	184 00	185 00
Summit			
Trumbull			
Tuscarawas	304	109 50	105 50
Union	56	32 00	32 00
Van Wert	1	8 00	8 00
Vinton	4	40 00	15 00
Warren	71	83 00	13 00
Washington	57		
Wayne	117		31 00
Williams			
Wood	116	86 00	80 00
Wyandot	20	114 25	88 00
Totals	5,660	\$2,833 17	\$2,272 91

7 A.

TABLE III—COUNTY SOCIETY REPORTS—NUMBER OF MEMBERS, VALUE OF FAIR GROUNDS, ETC., 1888.

Counties.	Number of members.	Grounds owned or leased.	Cash value of grounds owned, with improvements thereon.	Cash expended for buildings and other improvements on leased grounds.	Total indebtedness of Society, over and above cash on hand.	Total estimated wealth of the Society, over and above indebtedness.
Adams	267	Owned	\$2,200 00		\$965 00	\$1,235 00
Allen		"	20,000 00		300 00	19,700 00
Ashland						
Ashtabula	326	Owned	8,000 00		364 19	8,000 00
Athens	10	"	7,000 00		1,076 00	
Auglaize	1,235	"	10,000 00		306 72	
Belmont	125	"	6,000 00		2,510 55	
Brown	614	"	4,000 00		331 87	3,668 13
Butler	3,248	Owned and leased	40,000 00	\$2,000 00	8,463 99	33,536 01
Carroll	400	Owned	10,000 00		2,300 00	7,500 00
Champaign	115	"	3,000 00	500 00		
Clarke	895	Leased		15,000 00		15,000 00
Clermont	850	Owned	9,000 00			9,000 00
Clinton	511	Leased			2,100 00	
Columbiana	700	Owned	12,000 00		2,850 00	10,000 00
Coshocton	1,500	"	12,000 00			12,000 00
Crawford	262	"	15,000 00		2,800 00	12,200 00
Cuyahoga	423	Leased			128 23	
Darke	2,450	Owned	20,000 00		332 46	19,667 54
Defiance						
Delaware	570	Owned	22,200 00		2,216 26	19,983 74
Erie	1,250	"	75,000 00	42,372 93	278 67	
Fairfield	343	"	60,000 00		20,000 00	40,000 00
Fayette						
Franklin						
Fulton	300	Owned	5,000 00			5,500 00
Gallia	51	Leased				50 00
Geauga	737	Owned	10,050 00		650 00	
Greene	16	Leased		183 04	622 56	
Guernsey	49	"		103 72		1,040 14
Hamilton	859	Owned	65,000 00			1,000 00
Hancock		"	45,000 00		4,290 00	40,710 00
Hardin	247	"	14,000 00		4,800 00	9,200 00
Harrison		Leased				
Henry						
Highland		Leased		100 00		25 25
Hocking	142	Owned	10,000 00	5,000 00	1,975 00	6,000 00
Holmes	167	Leased		183 94	519 14	400 00
Huron	260	"		6,500 00	1,850 00	4,650 00
Jackson						
Jefferson	285	Leased		400 00	26 00	375 00
Knox	50	Owned				8,000 00
Lake		"	15,000 00			
Lawrence	29	Leased		2,000 00	2,318 73	
Licking	537	Owned	50,000 00		2,900 00	44,000 00
Logan	2,144	"	16,000 00		6,000 00	
Lorain	275	Owned and leased	14,000 00	1,000 00	1,687 49	14,318 51
Lucas		Owned	60,000 00		800 00	14,200 00
Madison						60,834 68
Mahoning	612	Owned	6,000 00		2,000 00	4,000 00
Marion	390	"	10,000 00		813 71	9,186 29
Medina	1,194	"	5,000 00			5,400 00
Meigs						
Mercer	1,200	Owned	10,000 00		2,000 00	5,000 00
Miami	24	Leased		8,000 00		900 00
Monroe	56	Owned	4,000 00		600 00	3,400 00
Montgomery						
Morgan	190	Owned	5,000 00		2,520 00	2,480 00
Morrow	34	"			1,850 00	
Muskingum	73	"	15,000 00		1,000 00	14,000 00
Noble	70	"	1,500 00			
Ottawa	167	"				1,800 00
Paulding	130	"	4,375 00		1,053 97	
Perry	28	Leased		1,500 00	1,700 00	

TABLE III—Concluded.

Counties.	Number of members.	Grounds owned or leased.	Cash value of grounds owned, with improvements thereon.	Cash expended for buildings and other improvements on leased grounds.	Total indebtedness of Society, over and above cash on hand.	Total estimated wealth of the Society, over and above indebtedness.
Pickaway	41	Leased			\$1,800 00	
Pike						
Portage	878	Owned and leased	\$13,000 00		3,900 00	\$9,100 00
Preble	2,750	Owned	10,000 00		1,800 00	10,200 00
Putnam	380	"	10,000 00		1,010 00	8,990 00
Richland	324	"	20,000 00			
Ross	370	Leased		\$400 00		
Sandusky	2,000	Owned	20,000 00		3,200 00	17,000 00
Scioto	133	Leased		5,000 00	800 00	3,000 00
Seneca	136	Owned	16,000 00		3,007 22	12,992 88
Shelby	230	"	11,000 00			13,759 21
Stark	648	"	50,000 00		2,466 82	47,534 00
Summit	2,530	"	50,000 00			
Trumbull	646	"	10,000 00		2,000 00	8,000 00
Tuscarawas	245	"	8,500 00			
Union	1,943	"	15,000 00		2,200 00	12,800 00
Van Wert	1,100	"	9,000 00		8,100 00	5,900 00
Vinton	68	Leased		4,500 00	750 00	3,750 00
Warren	1,760	Owned	10,000 00		7,550 00	2,450 00
Washington		"	6,000 00		3,850 00	2,900 00
Wayne	122	Leased		3,258 93	1,242 42	2,011 51
William						
Wood		Leased		200 00		
Wyandot	317	Owned	6,000 00		8,800 00	2,700 00
Totals	43,997		\$974,825 00	\$98,197 56	\$131,276 80	\$636,442 89

TABLE IV.—COUNTY AGRICULTURAL SOCIETIES—FINANCIAL EXHIBIT, 1888.

Counties.	Cash on hand at beginning of year.	Amount received from gate and entrance fees.	Amount received from booths, rents, permits, etc.	Amount received from all other sources.	Amount paid in premiums.	Amount paid in real estate, buildings or other improvements.	Amount paid for current expenses other than premiums.
Adams.....	\$2 86	\$687 10	\$100 00	\$387 15	\$238 81	\$1,235 00	\$120 44
Allen.....		2,028 66	469 00	335 96	2,009 21	83 75	788 10
Ashland.....		3,763 00	310 00	371 00	2,465 00	970 00	1,128 00
Ashabula.....		1,203 98	396 39		1,193 43	112 05	638 87
Athens.....	62 76	2,656 10	494 65		1,981 00	305 52	1,125 48
Auglaize.....	147 47	612 45	36 75				1,055 70
Belmont.....		2,168 95	835 80		1,522 25	942 29	1,862 18
Brown.....	766 54	6,671 25	2,577 15	88 00	4,565 00	6,848 07	7,045 87
Butler.....		2,521 54	474 15	8,846 35	1,791 88	1,000 00	754 32
Carroll.....		1,945 90	313 50	551 98	1,529 75	500 00	696 10
Champaign.....	290 74	4,861 54	611 50	2,249 48	4,512 40	1,823 99	1,552 24
Clarke.....	572 84	1,839 50	331 00	182 50	1,918 95	486 81	322 69
Clermont.....	789 20	1,769 95	418 90	609 71	2,062 00	169 92	757 80
Clinton.....	111 21	3,332 25	322 84	1,742 85	1,843 60	1,276 12	1,989 61
Columbiana.....		3,228 00	250 00		2,706 00	434 67	1,894 17
Coshocton.....	1,071 97	2,231 59	455 25	553 98	1,975 70	500 00	1,125 85
Crawford.....	251 90	1,125 38	136 00	429 55	1,069 25	50 00	744 43
Cuyahoga.....	84 52	6,784 85	1,649 00	883 83	4,748 68	1,544 72	3,441 13
Darke.....	569 49						
Defiance.....		1,948 67	401 65	5,257 22	2,591 00		4,520 76
Delaware.....	27 96						
Erie.....	188 69	4,273 95	1,440 45	11,138 88	6,526 50	5,612 14	4,406 60
Fairfield.....							
Fayette.....							
Franklin.....							
Fulton.....	168 18	1,136 50	226 00	317 18	754 57	292 00	473 86
Gallia.....		51 79		291 25	95 00		155 67
Geauga.....	540 59	2,798 40	501 85	2,008 64	2,251 95	1,955 06	994 04
Greene.....	513 00	1,769 49	383 50	650 49	2,458 00		1,280 00
Guernsey.....	722 05	1,054 98	85 50	274 97	786 25	108 72	257 84

Hamilton.....	249 25	3,978 66	1,988 70	2,497 75	4,045 60	1,045 82	3,949 22
Hancock.....	71 00	3,286 00	880 00	477 00	2,788 00	454 00	1,776 86
Hardin.....	3 78	2,001 25	582 00	386 80	1,888 00	962 00	62 83
Harrison.....	23 78	1,252 23	170 75	969 87	680 77		1,178 82
Henry.....		2,666 25	746 00		2,831 75	100 00	954 25
Highland.....		1,359 90	583 00	1,906 91	1,714 85	1,327 54	801 26
Hocking.....		2,615 15	279 00	307 76	2,043 53	188 94	1,493 21
Holmes.....	26 83	2,491 01	680 53	1,066 89	2,891 50	987 00	1,396 00
Huron.....							
Jackson.....		1,442 45	171 50	377 93	1,354 45		458 07
Jefferson.....							
Knox.....		2,146 86	267 35	1,983 51	1,736 35		2,271 38
Lake.....		293 22	15 00				367 86
Lawrence.....	60 50	3,690 45	384 00	3,390 97	3,462 00	200 00	4,900 35
Licking.....	690 68	3,074 25	1,475 87	962 67	2,921 00	765 13	1,784 15
Logan.....		3,274 56	242 90	529 26	1,810 95	806 23	1,484 48
Lorain.....	17 93	13,063 75	2,163 37	4,035 27	10,389 33	1,417 44	7,566 94
Lucas.....	132 86						
Madison.....		2,301 75	298 00	2,354 23	2,029 00	459 40	1,042 24
Mahoning.....		3,532 51	674 60		2,960 50		1,627 35
Marion.....	167 03	2,438 78	546 09	111 10	2,129 45		1,619 96
Medina.....	989 94						
Meigs.....							
Mercer.....		2,300 00	300 90	1,700 00	2,729 50	625 00	500 03
Miami.....	1,015 50	4,024 90	836 20	484 07	2,920 50	1,384 29	1,196 53
Monroe.....	6 10	987 14	74 00	288 88	583 20	488 72	282 57
Montgomery.....							
Morgan.....	46 44	663 62	125 00	698 35	993 50	116 43	429 92
Morrow.....		1,931 00	889 25	927 63	2,465 10	392 42	1,013 85
Muskingum.....	92 99	1,510 19	336 75	368 65	1,082 00	109 52	1,054 89
Noble.....		231 57	28 00	211 88	570 55	59 43	96 00
Odessa.....	211 86	396 50	58 43		402 87		232 25
Ottawa.....	175 00	1,309 35	573 55	1,458 50	1,096 50	634 80	2,945 07
Paulding.....		3,669 67	149 50	34 00	235 87		856 96
Perry.....		3,255 25	277 25	80 00	2,740 00		860 41
Pickaway.....							
Pike.....		2,314 00	393 50	110 70	2,022 35	10 00	1,128 94
Portage.....	44 71	3,497 00	1,000 00	1,478 00	2,896 00	700 00	2,639 00
Preble.....	243 87	3,224 35	631 25	237 13	2,737 45	1,392 95	1,249 82
Putnam.....	1,268 43	2,478 23	661 60	1,262 50	1,706 87	2,235 14	1,417 44
Richland.....		7,291 75	689 10	400 00	5,087 00	400 00	2,184 72
Ross.....	220 73	3,146 32	396 25	129 25	2,566 50	1,245 40	1,245 40
Sandusky.....	124 02	3,398 50	556 26	1,694 90	2,344 00	2,305 00	1,206 34
Scioto.....	166 39	1,608 76	964 20	494 77	700 00		2,535 53
Shelby.....	3,010 82	2,570 13	941 24		1,983 25	689 56	1,379 67
Stark.....	637 73	6,939 23	1,312 27	410 75	4,142 35	4,471 25	3,153 00
Summit.....	17 04	7,224 59	1,474 90	310 00	4,447 00	2,200 00	2,160 20
Tuscarawas.....	62 48	2,087 85	656 50	1,088 80	1,688 75	1,437 05	894 41
Union.....	1,052 75	2,499 25	298 00	421 50	1,966 75	408 53	884 92
Van Wert.....	08	2,555 52	1,082 00	500 00	2,842 50		2,060 97
Vinton.....		1,647 62	367 00	570 28	1,607 56	1,004 35	803 20
			554 25	433 50	1,635 00	1,360 15	390 22

TABLE IV—Concluded.

Counties.	Cash on hand at beginning of year.	Amount received from gate and entrance fees.	Amount received from booths, rents, permits, etc.	Amount received from all other sources.	Amount paid in premiums.	Amount paid in real estate, buildings or other improvements.	Amount paid for current premiums, expenses other than
Warren		\$2,702 08	\$910 40	\$1,176 87	\$721 27	\$2,655 73	\$1,408 80
Washington		1,047 20	110 75	894 79	453 92	833 66	978 27
Wayne	\$1,209 64	2,154 55	260 00	646 60	1,207 80	1,065 15	820 96
Williams							
Wood	1 77	1,021 00	284 00	900 00	1,277 00		929 78
Wyandot	65	2,045 25	887 00	540 95	1,597 50	170 44	1,167 26
Totals	\$20,762 87	\$200,271 48	\$41,571 13	\$79,717 32	\$161,600 82	\$61,637 70	\$112,296 54

REPORTS FROM COUNTY SOCIETIES.

ADAMS COUNTY.

The principal crops raised in Adams county are corn, wheat, oats, timothy, clover, potatoes and tobacco. The crop of corn in this county is largely in excess of an average crop, and but for the ravages of the cut-worm and chinch-bug in early part of the season, and storms and early frosts of the latter portion of the season, there would have been an extraordinary crop. We would put the average per acre at twenty bushels.

Of wheat we had very much less than an average crop, caused by an extended drouth in fall and also in the early spring. The average of wheat per acre will not exceed ten bushels.

Oats were light—not much sown and a poor crop.

Timothy was very short, not one-half of a crop.

Clover was almost a failure, caused by drought in early part of the season.

Potatoes hardly half of a crop, owing to the above causes.

A very large crop of tobacco was raised. Tobacco culture is on the increase in this county, and has become one of our principal products. Early frosts interfered with the maturing of a portion of said crop, but the greater portion of it was safely housed.

The apple crop was very good, likewise peaches, plums, pears, and all kinds of small fruit. What is called the "black knot" threatens to destroy the Damson plum tree of this county. The loss of our plum orchards would be a serious drawback to our people, as the cultivation of the Damson plum was profitable.

Altogether the prospects of agriculture are encouraging in Adams county, and our people, who are principally farmers, are in good spirits, and expect to make greater efforts than ever to improve the condition of agriculture.

ALLEN COUNTY.

The twenty-sixth annual exhibition of the Allen County Agricultural Society was held at Lima, Ohio, on the 4th, 5th, 6th and 7th days of September, 1888.

The exhibits, in number, variety and quality, were fully up to the expectations of the society.

The weather during the last two days of the fair was favorable and the attendance large.

The Art Hall seemed to be the greatest magnet on the grounds, for in that department the skillful and artistic ingenuity of the fair sex was to be seen in greater variety and rarer beauty than ever before.

The horse show was good, there being 199 entries, as follows: Imported draft, 11; roadsters, 55; general purpose, 35; native draft, 39; matched pairs, 7; sweepstakes, 21; speed, 31.

There were but 50 entries in the cattle department, which shows a declining interest. Owing to the dull sale of beef cattle, the Short Horn breeds have been much neglected during the past few years.

In the sheep and swine departments there were 44 and 51 entries, respectively. The quality of stock exhibited in both these departments was superior to any before shown.

The Poland-China breed of swine seems to be the favorite in this county, and we feel warranted in saying that better breed and finer specimens of this popular breed can be found nowhere.

The poultry show, in number, variety and quality, excelled all others before given, and attracted much attention. There were 96 entries in this department, which made competition lively.

Other departments were alike well represented, and, all things considered, it was one of the most interesting and successful fairs ever held by the society.

CROPS.

Owing to the unusual severity of the winter of '87 and '88, the wheat crop was almost an absolute failure. In consequence of the bad condition of the wheat crop in the spring, there was double the acreage sown to oats that otherwise would have been done. It was well, for the yield was immense. The hay crop was rather light and did not go into the mow in first-class condition, owing to frequent showers during harvest. Corn, the principal crop, was above the average in quality, but much of it did not mature well, making it necessary to sort it before cribbing. The potato crop was an average one, and of a fair general quality. There was an abundance of fruit of all kinds.

PETROLEUM.

The oil traffic, which appeared in its infancy three years ago in this county, has grown into mammoth proportions. There are 850 paying wells in this field. The principal part of the product is collected at Lima

from which point pipe lines radiate in all directions. The Buckeye Pipe Line Co. (Standard Oil Co.) alone brings in 32,000 barrels per day, which is less than one-third of the daily production. From Lima to Chicago is extended an eight-inch pipe line, through which is pumped 10,000 barrels a day to the latter place, where it is distributed, principally for fuel purposes. The surplus oil is stored in large iron tanks with a capacity of 35,000 barrels each. At the present writing (January 1, 1889) the Standard Oil Co. has in store in this county 17 million barrels.

While the oil industry has added much wealth to our tax duplicates, it has interfered materially with the agricultural interests of the county. Thousands of acres of good production land have practically been abandoned to the oil operator. Fences are thrown down and pipe lines extend in all directions on the surface of the land. Nor is this all; the waste oil from overflowing tanks, pipe-line leaks and the refuse from the refineries find way into the brooks and creeks, and to a great extent destroy stock water privileges.

ASHTABULA COUNTY.

The agricultural society of this county is in a fairly prosperous condition. The attendance and exhibition has gradually increased year by year till this last year.

Our exhibition increased this year, being full in all departments, but unfavorable weather on the third and fourth days cut down the attendance and necessarily the receipts. Except for the weather it would have been the most successful fair in the history of the society. As it was, we paid all expenses and premiums in full, and about six hundred dollars in improvements. The society is growing in the respect of the people and its influence. The county carries on a miscellaneous farming.

Dairying is an extensive interest. The Holsteins, Short Horns, Devons, Jerseys and Ayrshires all have their friends.

The raising of good horses is an important branch. Hundreds of horses are shipped to eastern markets every year.

While there are no very large flocks of sheep kept, yet a large majority of the farmers have small flocks, so that the wool interest is important. But sheep are kept more for mutton than wool, the larger breeds exceeding in numbers the fine wool.

The raising of swine is increasing; many more being shipped from the county than a few years ago.

An important and encouraging fact, connected with the live stock of this county, is that there is a growing interest in improving stock, and the

horses, cattle, sheep and hogs of this county are much better in quality than a few years ago.

Corn, wheat, oats and potatoes are all successfully raised in the county. Barley, mullet and rye are being raised in the last two or three years, and are proving profitable.

Fruit is an important interest in the county.

The last season was a productive one. The oat, potato and corn crop in 1888 was the best for years.

The hay crop was good; pasturage was first-class during the whole season.

The wheat crop was an average crop.

Fruit was very poor, not as good as the average.

This county was not injured to any extent by destructive insects in 1888. No branch of farming that cannot be successfully and profitably carried on in this county. The people are intelligent, sober and industrious. School-houses and churches are numerous. Out of twenty-eight townships only two have any saloons. Considering the price of land, no county in the State offers as great inducements to farmers as Ashtabula county.

E. JAY PINNEY,
THOMAS MCGOVERN, *President.*

ATHENS COUNTY.

The thirty-seventh annual fair of the Athens County Agricultural Society was held August 29, 30 and 31. There was more than ordinary interest manifested in last year's fair, as every one seemed interested in its success, which was assured up to the last day, when it commenced raining early in the morning and kept it up pretty much all day. However, we were able to pay off our premiums and expenses without increasing our indebtedness, but it will take all of our receipts. Our display was equal to former years, and some departments showed a marked improvement over former years.

IMPROVEMENTS.

Owing to the indebtedness of the society incurred in former years, there was no improvements other than some slight repairs.

STOCK.

The display in this department was equal to former years, with a very marked improvement in horses.

POULTRY.

There was a good exhibition of poultry—larger than any previous year.

CROPS.

Wheat crop was very light, but good in quality.

Corn crop was far above the average, but was somewhat damaged by the wet weather.

Hay was only about half an average crop, and very poor quality.

FRUITS.

Our supply of fruits were never equaled in quantity or quality, there being an abundant supply of all kinds. Athens county is making rapid advances in growing fruits.

Respectfully,

JAMES C. BOWER, *President.*

AUGLAIZE COUNTY.

The twenty-fifth annual fair of the Auglaize County Agricultural Society was held on their grounds at Wapakoneta, Ohio, October 2, 3, 4 and 5, 1888, under the general supervision and direction of the Board of managers of the society.

The premium list was very extensive, and the exhibition in all the departments merited much praise. The managers have received many compliments from the members of the society for bringing every department to a high standard of excellence. The total entries made were 1,800; the amount of premiums offered, \$2,000; the amount awarded, \$1,965; the receipts from all sources, \$3,500.

In live stock every department was represented, so much so that the managers were compelled to erect temporary stalls and pens for the accommodation of exhibitors of cattle, sheep and swine.

The exhibit of horses, as usual, was very large and of superior breeds, consisting of imported and native draft, general purpose, roadster and speed animals.

The cattle, sheep, swine and poultry departments were well represented, and the exhibit of each was of superior excellence. The exhibit of agricultural implements and machinery was unusually large. The exhibit of grain, vegetables and fruits, and the display of jellies, jams,

preserves, canned fruits, pickles, etc., was immense, and of superior quality.

The display in the Art Hall was of unusual magnificence and beauty. It embraced lovely paintings in oil and water-color, done by experienced hands, as well as those of pastel and crayon drawing. The display of needle-work, dry goods, boots and shoes, drugs, ready-made clothing, jewelry and stationers' goods, also collection of coins and insects, together with the beautiful exhibition of flowers, made the Art Hall very attractive.

The grounds embrace an area of 30 acres, beautifully shaded and abundantly supplied with water, and enclosed by a good, substantial paling fence.

Our buildings are large, commodious and substantial, affording convenience to exhibitors, and comfort to visitors. The grand stand is a model structure, affording ease and comfort to the guests of the society, and will seat 2,500 persons.

Our grounds were illuminated by natural gas, which is extensively found in this county.

BELMONT COUNTY.

The Belmont County Agricultural Society, after a long season of successes, has met with a second successive providential reverse. As reported last year, the cyclone of April 27, 1887, cost the society a large sum in the way of buildings and fences destroyed, which used up a large proportion of the receipts of the fair of that year. The fair of 1888, on September 5, 6 and 7, opened auspiciously with the usual large show in all departments, and especially was this the case in the various stock classes. At an early hour on the morning of the third day, with thousands of people en route to the grounds, a hard rain set in, and the fair, so auspiciously opened, was a financial failure.

As the various committees had not yet passed upon the articles on exhibition, and they were gathered together by exhibitors in great haste, no awards could be made, which, of course, was a great disappointment to everyone.

STOCK.

The improvement in stock of all kinds is very marked in Belmont county, farmers and stock-breeders generally being fully up to, and ahead, of the surrounding country, in raising animals best adapted for all purposes on the farms.

PRODUCTS.

The principal productions of this county, with the result of the year's crops, may be summed up as follows:

Wheat—Crop short, but grain of good quality.

Hay—Moderate crop and good quality.

Oats—Big crop and good quality.

Corn—Large crop, but much soft corn, owing to wet fall weather.

Potatoes—Fair crop and good quality.

Apples—Large crop and good.

Pears—Big crop.

Cherries and all other small fruits, there was a good crop, and excellent in quality.

Garden products were above the average in quantity, and very excellent in quality.

Our county is fast coming to the front as a manufacturing and mining center, with industrial plants going up in various localities, and new coal fields coming into the market by prospective new railroads, and there can be no reason why our county cannot offer facilities for the safe investment of capital second to none in the State.

BROWN COUNTY.

The agricultural condition of Brown county remains much the same as last year, except corn and tobacco crops, which greatly surpass last year in quantity, but the quality is not so good, caused by the damage of early frosts. Other crops are about the same as last year. The fruit crop was the largest of many preceding years. The season was extremely wet from July to November.

As to the general progress of agriculture, some advancement may be noted in some departments, while a careful observer can mark points that require more minute attention. Too much praise cannot be bestowed upon the improved methods of growing corn and tobacco. Every energy seems to be exerted upon these two crops, especially the latter. One particular feature to be commended in tobacco growing by some, is the plan of setting the plants to be cultivated for plowing both ways, as in the old method of planting corn, thus saving much work with the hoe, and avoiding the too common fault of crowding too many plants to the acre. More tobacco is injured by attempting to grow more on a given space than the land can reasonably sustain, damaging both land and crop. The excuse may be given that, although the leaves are small, the quality is

fine; the leaves are often so small that the grower almost or entirely loses his labor. The method of drilling corn and cultivating the one way can be considered a success only in furnishing a plan to cultivate a large tract of land with as little work as possible. If corn is to be plowed but once or twice, the plan may be tolerated. But when the crop is to be plowed as often as four times the same way, it will unavoidably leave the land, be it either hilly or level, in a bad condition for any other crop, even if it should be broken up anew. It may be observed that whoever plants corn the old-fashioned way yet, and plows well and often both ways, still furnishes the best yield per acre and best quality of corn in the markets. There is yet the same carelessness in the cultivation of wheat, oats and rye, as heretofore. Farmers seem to be going on the hit or miss method with these crops, and the results are generally failures. Much of the wheat-growing seems to be a kind of patch-work—often small plots that have been cultivated in tobacco. An ordinary crop of tobacco being from four to six acres, hence a wheat crop is often the same land. Oats are scattered over some corn, stubble land, and dragged over with plow or harrow—the fastest way to avoid much work that one can devise—and trust to luck for a crop. This kind of farming is causing a large amount of land to lie idle. This patch-farming, as it may be called, is resulting in some good by resting the poorer lands. There is much thin and worn land that is improving steadily by idleness. It is often remarked by those who observe, that the rich lands are becoming poorer, while the poor lands are constantly improving. All reasonable means should be encouraged, yet the poorer lands might be cultivated more and generally improve during the time; but the richer lands are undoubtedly overworked. A few years since some farms that were considered the most productive in the country, are now found to be seriously injured, and should have a period of rest. Grass and clover should receive more attention, while land is resting. Although the old lands of the county are gradually improving by rest, yet, if they had more pasturage upon them, their improvement would be more rapid. It is to be hoped that fruit-growing may continue to receive the favorable attention as heretofore, for this industry still holds its position of importance among the people. Stock-raising is receiving more care than at any time in the past; especially is this the case with thoroughbreds. The thoroughbred horses, at the last fair, were much more numerous than at any previous fair. Among the exhibitors of thoroughbred draft horses at last fair may be noted as prominent: S. M. Pickerill, E. S. Moorehead, R. T. Thompson, J. P. Hebling, J. C. Montgomery and Mason and Keech. These gentlemen are entitled to great praise for the capital and care bestowed upon this class of horses. Thoroughbred cattle are arriving at a standard of perfection

that has long been desired. Among breeders may be favorably mentioned: J. L. Devore, C. W. Edenfield, J. P. Richards and F. W. Dunham, breeders of Short Horns, and W. H. Holmes and W. C. Kendall, breeders of Jerseys, all of whom have very fine herds. The thoroughbred hogs of Harlow Brothers, and West and McBeth, formed a most attractive feature of last fair. In the sheep department the thoroughbred Merinos, Cotswalds and Downs were admired by all. Those representing these classes—Harlow Brothers, Albright & Stivers, G. S. Howland and H. H. Redkey—should feel proud of their flocks. Our Fair Board has adopted the rule that all thoroughbred stock shall be registered or eligible to registry to compete for premiums. If exhibitors do not or cannot furnish such proof of purity of stock, they must enter their stock in grade classes. This is found to be a most beneficial rule, as it operates as a protection for all persons who are desirous of buying pure-bred stock, inasmuch as it points out positively at an exhibition, who can establish purity of stock and who cannot. Honest people are often imposed upon by persons who represent their stock as thoroughbred through fraudulent motives or ignorance. That the rule is just, can scarcely be questioned, as Fair Boards are really guardians of the public, who come to a fair to investigate the qualities of stock and articles placed on exhibition. The people are seeking instruction and need some positive line of distinction, whereby they may know that what they examine is just as it is represented to be.

The Board of Directors of our fair are entitled to the esteem of all exhibitors in the various departments for their liberal and equitable schedule of premiums, as much depends upon the prosperity of a fair by a carefully arranged premium list. The patrons of a large fair are as various in their tastes as the vast number of animals and articles that are brought together on exhibition. Many well-meaning Boards of Fairs have struggled for years to build up their societies with a few large premiums for winning cards to draw patronage, and find from some cause they have failed, and are at a loss to know the reason. It is a case of too much money spent upon too few items; it is a failure in economy; there are too few persons gratified personally by large premiums, and too many with wounded feelings by the absence of many small premiums. There is many an honest toiling woman who spends days, or even weeks, preparing an article for a fair, involving art and design beyond all the comprehension of hostlers and jockeys combined, and yet she is thrust aside with a mere pittance or a complimentary premium, while he, with jockey cap and whip, who holds the reins, drives away with the plunder and leaves a Board of Managers to settle up a fair as best they can, and too often they find themselves hampered for finances to get settled up even for the next year. Let Fair Boards make more classes, with more extended

premium lists for exhibitors, with the same amount of money, and they will observe an increase in patronage that will astonish them. Let those who doubt, try the experiment and find good results.

This is the experience of a Board that adopted this plan many years ago, with a society largely involved in debt, and fierce dissensions among its patrons, and as a reward has paid off all debts, increased premium lists, made large improvements on their grounds, restored harmony among their patrons, and now have a society as prosperous as any in the State, with a membership almost doubled in ten years. Nothing so builds up a fair for the amount of money expended as extensive premium lists for all the departments exhibited in the halls, although the premiums may be small—long lists of articles in numerous classes, many kinds of grain, vegetables, fruits, flowers, preserves, jellies, needle-work—everything of taste and refinement in which an industrious and intelligent people may be interested—all of which combine a general exhibition, attractive alike to exhibitors and visitors. As many classes as possible in the stock departments is another great incentive to the prosperity of a fair. Often is the objection made that the animal is in the wrong class, when, in fact, there is no proper class in which the exhibitor can show. Our fair has avoided this and other objections, by making additional classes as fast as competition required them, although the premiums were not so large as when there were fewer classes, yet they have been such as to inspire great competition, as our liberal patronage for many years has attested.

BUTLER COUNTY.

The Butler County Agricultural Society, by its President and Secretary, in compliance with the statutes, hereby submit to your honorable body the following statement of the condition of agriculture in its county:

The principal crops raised are, wheat, corn, barley, potatoes and hay. There is also quite a number of acres of land around the city of Hamilton cultivated in market gardening, for which a ready market is found at fair prices.

Considerable attention is paid to the breeding and raising of horses, cattle and swine. It is to the county of Butler that the world is indebted for the world-renowned Poland-China hogs. It is also the home of the finest herd of Polled Durhams in the United States, owned by Messrs. Shafer and Clawson.

Wheat—The crop of 1888 was the largest raised in the county for some years—in many farms the yield being over twenty bushels per acre.

Corn—The largest crop ever raised in the county ; some wheat injured by the continuous rains during October and November.

Barley—Fair yield, but prices low.

Hay—Yield only fifty per cent. of the previous year.

Potatoes—Average crop—prices ranging from forty to fifty cents per bushel.

Fruit—The fruit crop of 1888 will long be remembered by the citizens as being the largest crop ever gathered in the county.

The thirty-ninth annual fair was a success, considering the many attractions, such as the centennials at Marietta, Columbus and Cincinnati.

Total number of entries, 4,127 ; amount offered as premiums, \$4,852 ; amount awarded as premiums, \$4,594.

The society has a debt of about eight thousand dollars, caused by the erection of a permanent amphitheater to accommodate the growing wants of the fair, which debt we hope in a few years to liquidate.

The great success of the Butler county fair has been in keeping gambling and intoxicating liquors from these grounds, and in always paying the premiums in full and promptly.

CARROLL COUNTY.

The thirty-eighth annual fair was held on the society's grounds near Carrollton, October 2d, 3d, 4th and 5th, 1888, and was a success, although we had wet weather on the 4th ; the grounds were well filled. Our entries were large ; the Floral Hall was nicely arranged with nearly all new-made articles. The display of fruits was fine. The Agricultural Hall was packed with every product raised on the farm. The horse department was well filled, and the lovers of the turf were all pleased with the speed ring. The free-for-all pace was exciting ; seven starters pacing in 2:26½. There was a falling off in the cattle department ; the sheep made up for the cattle ; the swine and poultry class was up to the standard. We had an old-fashioned fair—no gambling, no drinking, and consequently no need of police. We paid eight hundred and fifty dollars of our indebtedness, after paying all of the premiums and expenses. We boast of little Carroll county as a coal mining district, nor is it behind as a wool-growing and sheep-raising county.

We had a very wet fall. Our corn crop was very large, with a great deal of soft corn. The hay crop was short ; the oats was a full crop. The wheat crop was a usual one.

Our society is made up of good, live farmers; they all take an interest in the work. We are constantly making improvements and keeping our grounds in good shape. We are now carrying a debt of about twenty-three hundred dollars. With good weather we can soon pay that off. We offer big premiums and pay them promptly. Competition is open to the world, and, with carefully selected judges, the best stock is sure to carry off the premiums. We have considerable good, cheap lands for sale. Speculators would do well to come here and invest capital. Our town is high and dry, free from malarial fevers; it is in the healthiest part of the State. The land is adapted to stock-raising—well watered, well timbered, with stone coal in abundance; good churches, good schools, and industrious people.

CHAMPAIGN COUNTY.

The thirty-seventh annual fair of Champaign county was held, as usual, upon the society's grounds, at Urbana, Ohio, August 28, 29, 30 and 31, 1888. The fair was representative of the high state of agriculture and stock-breeding of the county. It was a decided success, and so pronounced by all who attended. The number of entries made, the amount of premiums offered and awarded, the attendance and the receipts were all the largest known within the last twenty years. The exhibits in the different classes of the live-stock departments were excellent and high-bred animals. The exhibits were so large in this department that the first two days were consumed by several carpenters in building temporary stables and pens for the accommodation of exhibitors. The exhibit of farm products was exceedingly large, there being near seven hundred entries in this one department. The fine art, the floriculture, and the textile fabric departments were well filled, and in each many beautiful specimens were exhibited. The exhibit of machinery, carriages, buggies, wagons, implements, etc., far surpassed anything of the kind ever shown at the fair.

Wheat, corn, oats, clover, hay and potatoes are the staple products of the county. Rye, flax and barley are produced, but their production is comparatively small. The wheat crop of 1888 was about one-third of its usual average yield per acre, which was estimated to be about seven bushels per acre, and that being of an inferior quality.

The production of corn per acre was unusually large throughout the county; the quality, however, was not so good as usual, owing to early frost and wet weather during the month of October.

The number of acres sown in oats was unusually large, owing to the fact that many acres of wheat were killed or frozen out during the pre-

ceding winter, therefore were plowed up and sown in oats in the spring. The production of oats per acre was only an average yield.

The potato crop was very good and of a superior quality. The hay crop was not more than a half crop, owing to the dry weather in the early part of the season, but what there was was of an excellent quality. The production of vegetables and fruits, peculiar to the climate, was large and of superior quality. The number of farmers using fertilizers is annually increasing; and they generally use implements and machinery best adapted to preparing and cultivating the soil.

Respectfully submitted.

C. H. GANSON, *President.*

J. W. CROWL, *Secretary.*

January 15, 1889.

CLARKE COUNTY.

The ——— annual fair of the Clarke County Agricultural Society was held on August 20, 21, 22, 23, 24 and 25, 1888. The severe rain on the first day caused the managers to extend the time of holding the fair until the 25th, instead of closing on the 24th, according to the original arrangement. The weather was fine the last four days, and the attendance was very large, exceeding that of previous years.

The entries were as large in most of the departments as was ever known, the display of horses being especially fine, and attracting much attention and favorable comment.

The display of cattle was significant, in that it showed the continued interest that stock-raisers are taking in the improved breeds.

The stock-raisers of our county are each year paying more attention to the better breeds of all classes of stock. Clarke county, during the past year, as in most parts of the State, was blessed with the largest fruit crop known in many years, and the display in that line was in keeping with the increased production. The machinery department, as in the past, was well represented—our local manufacturers making a large and creditable display.

Many improvements have been made on the grounds during the past year, the principal one being the erection of an additional amphitheater at the speed ring, at a cost of \$1,500.

Many new stalls for stock were also built, but the society, notwithstanding the expenditures made for these improvements, still have a surplus on hand, as is shown by the business report of the Secretary. All things considered, the past year has been a favorable one for our farmers,

and with the exception, perhaps, that in some instances the prices for produce have been lower than formerly, the progress and advancement for the agricultural interests of our county for 1888 have been a success.

Respectfully submitted.

C. STEWART, *President.*

CLERMONT COUNTY.

The condition of agriculture in Clermont county is gradually growing better. The drought of the summer and fall of 1887 operated strongly against agricultural interests, but with a favorable season during the past year we have been enabled to overcome all that was lost, and have a good surplus to dispose of. This county is not noted with the wheat-growing counties of the State, but the last crops were satisfactory, as were also other small grains. Vegetables and fruits of every kind were abundant. The yield of corn was enormous, being perhaps the largest ever grown in the county, which, with the increased energy shown of recent years in raising stock, will be almost entirely consumed within the county. The indebtedness of farmers of this county is diminishing, and now there are but few comparatively oppressed with mortgages upon their farms, and would be still less if taxation was more equalized in the State. Everything belonging to the agriculturist is in sight for assessment, which makes less evasion of taxation than by any other class of citizens. Our surplus capital is principally held within the county. There are three National Banks within the county, in which the farmers have a reasonable amount of stock. Building and Loan Associations are established in several of our towns, in which farmers and laborers of small means are availing themselves of their benefits. Our last fair, which was the fourteenth annual exhibition of the Clermont County Agricultural Society, was held September 4, 5, 6 and 7, 1888. The attendance this year, as it has been for many successive years, was large, although a small reduction was noticeable on account of so many of its patrons being in attendance at the "Centennial Exposition of the Ohio Valley and Central States," held in Cincinnati. The exhibition in the several departments was good. Flowers, fruit, dairy and pantry products, needle-work and fine arts, shown in the Floral Hall, presented a gallery of attractions seldom witnessed at county fairs, while at the same time the show of horses, cattle, sheep, swine, machinery and mechanics' manufactures were equally grand. In conclusion we will say that our society is in a flourishing condition, and with judicious management in the future, as in the past, will remain so for many years.

CLINTON COUNTY.

This county is situated midway between Cincinnati and Columbus, and is traversed by the Midland, Baltimore & Ohio, and the Muskingum Valley railroads.

Wilmington, the county seat, is nearly centrally located, on rolling ground, and contains about five thousand inhabitants.

Clarksville, Blanchester, New Vienna and Sabina are thriving villages, each having a population of more than one thousand inhabitants.

Each of these villages have railroad facilities, church privileges, good school accommodations, and dry goods stores and groceries, as well as a post-office, having more than daily mails.

Her soil is largely black loam, and is very fertile, which produces all the grasses, grains and fruits, bounteously, of the north temperate zone.

Farming is profitable; this season has yielded plenty of apples, peaches, pears, plums and grapes. Each of these have an enemy here. The peach has the borer; the plum the black knot; the pear the blight; the grape the mildew, and the apple the moth. These scourges are mentioned because they have baffled every effort to destroy them. The ravages of all these, and more than these, as the drouth of last year, and the frosts of spring, and the freezing of the winter did not prevent the abundant supply of the most perfect fruit—better than has been for years.

Wheat was not an average crop; corn was more than an average crop in quantity, but most farmers had a large per cent. of soft corn.

Hogs went off at good prices, some as high as six dollars, gross, and the bulk of them not lower than five dollars per hundred, gross.

There was a circling strip of territory, more than a mile in width, reaching nearly across the county, where all, or nearly all, suffered from hog-cholera; the remainder of the county was comparatively free from this disease.

More oats was grown than common; the season was more than ordinary wet; the oats grew rank, and much of it fell down.

Early potatoes did well—better than late ones.

Some used commercial fertilizers on their wheat, and most who did so maintain that it was profitable.

As usual, Clinton county had four fairs. The County Agricultural Society Fair was held at Wilmington on July 31, August 1, 2 and 3, 1888. The attendance was not such as to make it a success financially. The Board had to borrow money to pay the premiums.

The other fairs are joint stock concerns, and were held at Sabina, Martinsville and Blanchester; they rivaled in size and attendance the one at Wilmington, and possibly made sufficient to pay their premiums.

It might be better if there was but one fair in the county, but what one should it be? The Agricultural Society will not yield, nor can it compel the others to stop, and as a result Clinton will continue (at least for a while) to have four fairs.

The past season has been a prosperous one; her merchants, mechanics, and farmers are not depressed; all are contending in the battle of life, striving to educate their children and to better their condition.

COLUMBIANA COUNTY.

Columbiana county is situated in the northeastern portion of the State, abutting the Pennsylvania line, and skirted by the Ohio River on the south-east. It contains nearly 470 square miles and about 300,000 acres, with fully one-half in an excellent state of cultivation. It contains about 64,000 population, and ranks fourth in importance among her sister counties. Nature has provided bountifully of her store for Columbiana county. She has given us rolling land, fertile soil, and hills full of coal, iron, limestone and fire-clay. As a natural sequence we have not only a rich and populous farming community, but have diversified manufactories in the shape of blast furnaces, rolling mills, machine shops, sewer pipe works, potteries, carriage manufactories and many other industries. These provide a market for our agricultural products at our own doors, and hence our rapid strides toward prosperity. Farm property will average \$45 per acre for land, as it sells the year round.

The county is traversed by the Pittsburgh, Ft. Wayne & Chicago R'y on the north and the Cleveland & Pittsburgh on the south and west. A branch of the Erie runs south as far as New Lisbon, and the C., M. & C. runs from New Gallilee, Pa., east to New Lisbon. All along these roads have grown up thriving towns and prosperous communities.

The principal towns of the county, with their industries, are as follows:

East Liverpool, potteries and sewer pipe, 8,000 population.

Wellsville, potteries, sewer pipe and machine shops, 6,000 population.

Salineville, coal mines, 3,500 population.

New Lisbon, the county seat, sewer pipe and woolen goods, 3,000 population.

Leetonia, blast furnaces (4), rolling mill, and coal, 3,500 population.

Salem, machine shops, engine works, nail mill, label printers and tile works, 6,000 population.

Columbiana, carriage manufactories, etc., 2,000 population.

East Palestine, coal mines and sewer pipe, 2,000 population.

There are also other and smaller towns, which are of growing importance.

Salem and East Liverpool are both cities of the second class, the former with free mail delivery.

The farmers of Columbiana county are progressive, and are freely abreast with the times. The use of commercial fertilizers is very marked among them and growing in importance each year.

Much attention is paid to breeding fine stock also.

Among heavy horses a number of excellent Norman, Clydesdale and Belgian horses and mares have been imported. Fancy roadsters are bred also in increasing numbers. The Clay and Wilkes strains have taken the lead.

For cattle, Durhams and Jerseys are the favorites, although the Holsteins and polled breeds are coming into favor.

Swine has its devotees among Poland-China, Berkshire and Chester breeders.

Columbiana county's intelligence may be fairly estimated by the support given to home papers. There are 18 newspapers published in the county, five of them dailies, and all give evidence of a generous support. Besides these, many thousands of city weeklies, dailies and agricultural periodicals are taken.

Columbiana county is a good place to move to. She can offer first class schools and lots of them, excellent markets, good churches, newspapers, and intelligent, hospitable neighbors. What more can one ask?

ED. A. KING.

COSHOCTON COUNTY.

The thirty-seventh annual fair of the Coshocton County Agricultural Society was held on their grounds, near the town of Coshocton, on the 9th, 10th, 11th and 12th of October, 1888, and notwithstanding the many drawbacks, the fair was a success. The exhibits of horses, cattle, hogs and sheep were up to that of former years, together with that of the fine arts, floral and agricultural products, all of which made a good display. The machinery department was not so good, yet it was fair.

Coshocton county is bounded on the north by Holmes county, east by Tuscarawas and Guernsey counties, south by Guernsey and Muskingum and west by Licking and Knox counties. The surface is beautifully diversified by hills and valleys, presenting in many portions exceedingly grand and beautiful landscape views. By the junction of the Walhonding and

Tuscarawas rivers, forming the Muskingum, three beautiful valleys, are formed, radiating in different directions from the county seat. The valleys of Willscreek and Killbuck, with other tributaries to the above rivers are especially noticeable, and excellent springs in various sections supply abundant water for agricultural and domestic uses. The lands are especially adapted to fruit and cereals of all kinds, as well as grass and vegetables. Corn and wheat are the leading crops. A large proportion of the county is composed chiefly of limestone land, and excellent quarries of sand and limestone are successfully worked. The county lies wholly in the great bituminous coal belt, reaching close to its western border. Many valuable mines are in successful operation, and the output each year is continually on the increase, while the quality of this product is unsurpassed. Fine potters' clay is also found in abundance. The Coshocton County Wool Growers' Association was organized in 1864. This county occupies a special prominence in this product, and is well adapted to its cultivation, and rates about the third county in the State in wool production. In February, 1876, the National Merino Sheep Breeders' Association was organized at Coshocton, at which delegates were in attendance from many States.

The material prosperity of the farmers is especially attested by fine brick and frame residences, barns, churches, etc., which meet the eye of the traveler. Fine cattle and blooded stock have received considerable attention, and a visit to the plants of many of our farmers and stock-raisers elicits high encomiums from those interested in fine stock.

Coshocton is the county seat of Coshocton county, and has a population of 4,000 inhabitants, and is located at the junction of the Walhonding and Tuscarawas rivers forming the Muskingum, 69 miles east of Columbus. The county, from which it draws its support, has 27,000 inhabitants. The elements of a manufacturing center are abundant, needing only liberal, generous capital to develop latent resources. Coal in abundance, mined at its very door. The P., C. & St. L. R'y passes through the town. The C. & C. R'y terminates here, and a southern extension of the latter road—the Coshocton & Southern—is under construction. The S. A. & C. R'y has been surveyed, and right of way is now being obtained, and the Cannon Ball route is among the possibilities. The Ohio canal is just outside the town, across the river. A steel, axle and spring manufactory, basket factory and advertising novelty factory, four roller flouring mills, a furniture factory, cigar factory, planing mills, paper mill, foundry, woolen mill, egg case factory, two carriage factories and a creamery are the chief manufacturing interests of Coshocton and Roscoe, a little town across the river. The town is lighted by electricity. There are two banks, six churches, five school buildings, with a \$40,000 high school in process of erection

The town has many dry goods and grocery stores, and several hotels, three of which are first class. The varied industries give employment to about 1,500 of both sexes.

Tile draining is not much used except on low lands. Commercial and other fertilizers are being more freely used.

CRAWFORD COUNTY.

The thirty-sixth annual fair of the Crawford County Agricultural Society was held on September 25, 26, 27, and 28, 1888, at Bucyrus, and was, without exception, the finest exhibition ever held in the county. All the departments were filled, and the show of cattle, swine and sheep were ahead of other years. In the horse department the show was not so good as last year.

Fruit was very fine; good, both in quality and quantity. Grain and vegetables were much ahead of other years; there being a larger display and better quality.

The pumpkin show was very thin—only one on exhibition.

The weather was not as pleasant as we would have had it if we could have arranged it ourselves; it seems that it is our luck to have bad weather during the fair, as its history records, and as a result our exhibition was not as profitable in dollars and cents as the managers wished, as with the building of permanent improvements and necessary repairs, we came out short financially, but with the future benefits to the agricultural interests and the increased credit of the society, we think the balance in our favor. If Providence will only favor us with good weather next year there will be no trouble in putting the society on a good, sound and reputable basis.

Our county is as fine an agricultural county as there is in the State; there are very few acres of land that have not been utilized; what was once waste-land has been underdrained, and is now productive. The crops raised are all the products indigenous to the climate and soil, and that are produced in this part of the State; the industries being varied, the markets are good and easily accessible. Yet the past season the wheat crop was away below the average, the cause being the constant freezing and thawing in the spring, there being no snow to protect it. Our people are awake to the fact by former experience and demonstrations, that properly preparing the soil and seeding in time pays best. There never was a better crop of oats raised than this year, both in quality and quantity. Hay was also a very heavy crop; most of it was well cured and put up in good condition.

The corn crop, which is our main crop, exceeded that of many years, but owing to the cold fall and damp weather, it was late in being husked. There being very little soft corn, it is about all good and sound and fit for the crib.

The potato crop was very fine—the largest yield produced for many years.

There was about an average crop of fruit. The freezing in the spring after the buds were formed seemed to destroy our fruit prospects.

Our county is gaining in the breeding of good stock; a number of horses of the draft kind have been imported for breeding purposes, and it will not be long until Crawford will rank with the foremost counties in good horses.

We are also improving in our cattle industry; the farmers are breeding to thoroughbred bulls; this breeding up, as we call it, will not be long in producing a better quality of cattle.

The sheep industry seems to be dropping off since 1883. A great many have sold their flocks, claiming it don't pay to raise sheep and have to sell the wool at as low a price as it has been selling for the past few years.

As the swine industry goes with the corn, we stand equal to any county in the quality and quantity of hogs.

There are some commercial fertilizers used; yet it would seem that the natural fertility of the soil, and the painstaking care as exercised by our best husbandmen in the same, would not require it.

In the summer season we have excellent roads, but in the winter and spring they are almost impassable; we have no piked roads, yet the question has been before the people, and been defeated. If we had a few good pikes it would be very valuable to Crawford county.

Land is not as high as it was a few years ago. It is worth from \$30 to \$80 per acre, according to improvements.

Our county has good churches and excellent schools; new brick school houses have been built in nearly every district in the county, and each district is furnished with all the needful aids for teachers.

I submit the above as a report setting forth the condition of agriculture and stock-breeding.

Yours respectfully,

E. J. GIFFORD, *Sec'y.*

CUYAHOGA COUNTY.

The fortieth annual fair of Cuyahoga County Agricultural Association was held at Cuyahoga Falls, September 11, 12, 13 and 14, 1888. Was a

success; weather very pleasant. Owing to the races at the Cleveland Driving Park being at the same time of the fair, the speed classes were not all filled as well as would have been, had not our time of exhibition clashed. There has been larger attendance at former fairs, but never a better and more encouraging feeling existing between all parties interested, and the outlook is very promising for a fair equal to any in the State in the near future. All live stock being passed upon by an expert judge was a new departure, and gave entire satisfaction, as far as we could learn.

The association has a fine half-mile track, and the speed contest is becoming a leading feature of the fair, the larger part of the last two days being devoted to that purpose.

Horse Department—Well represented by all classes, the draft horse coming well to the front, and excellent showing of young horses and brood mares with colts.

Cattle Department—A good show of blooded bulls and cows, that will compare with any in the country, but in view of the fact that a majority of the farmers of Cuyahoga county, and especially along the lines of the many railroads leading into Cleveland, are giving their whole attention to supplying Cleveland market with milk, and abandon stock-raising altogether, looking to our neighboring counties south and west of us for fresh milkers, and selling their dry cows for beef, it looks as though this department would have to be stimulated in some other way than by our farmers. A few cheese factories in the eastern portion of the county are in successful operation during cheese-making season.

Sheep Department—Several pens of long, middle and fine wool sheep were on exhibition.

Swine—A very creditable exhibit in this department of the different classes, by the breeders in this vicinity.

The Farmers' Hall showed well the returns of a bountiful season, all kinds of grain and vegetables being liberally exhibited. Corn, oats and potatoes, a more than ordinary crop. Wheat, a full, plump berry, and many pieces made extraordinary yield. Rye, but little grown. Buckwheat done well; full and plump, and made a good return this season.

Hay not more than half-crop, except new meadows. Old meadows suffered terribly last year by drouth and grubs. Ensilage corn is being grown by the dairy farmers for fall and winter feeding, giving very satisfactory results.

Vegetable show was immense; fifty-three entries in potatoes. Fruit, not more than half-crop of apples, although a lot of fine varieties were well represented. Pears, a good crop. Peaches as well as grapes done finely along the lake shore.

In The Farmers' Hall a space is allowed for apiary products. Comb and strained honey presented in its many forms makes a fine display. In connection are the various bee hives and bee fixtures.

Domestic Fine Art and Floral Hall was, as always has been, well filled, and a very attractive part of the fair. Several large and valuable collections of Indian relics, and ancient coins and paper money are found here.

Machinery and farm implements were well and interestingly represented, as the association had provided ample steam power to drive such machinery and implements requiring the same for exhibition.

C. H. HUBBELL, *Sec'y.*

DARKE COUNTY.

Darke county has again been blessed with good crops of every kind of farm products but winter wheat, which was both poor in quality and yield. The corn crop was exceedingly good, and as this is the most profitable crop for our farmers, we congratulate ourselves on the good luck. The crop will mostly be fed to hogs, where they can be kept free from disease, which is the great detriment to feeding. As usual, we have the sure cure (professedly), but in all cases it fails. There is no other disease affecting any of the other families of live stock any more than usual. The same spirit of enterprise was manifested in improving the stock of our county at our last fair in September, there being some of the finest specimens of roadsters and heavy draft horses exhibited in the State, the most of which are owned here in the county. The winter wheat prospect is good at this time of writing.

All public institutions of learning and charity are well cared for. The county has wisely provided a home for the orphan children of the county, which will be completed in a few months, at a cost of about \$25,000, where all needy and helpless children can go and be properly clothed, fed and educated.

The keeping in repair of our free turnpikes is well done, and it can not be truthfully said that they are on the decline.

The cleaning out and cutting of new water channels, for the better draining of our rich valleys, is still going on; the farmers having learned by experience that one acre of good, thoroughly drained bottom land is far superior to the same amount of upper land. Another great thing that has been done for the county is the condemning of all the old water rights used in former years for milling purposes.

DELAWARE COUNTY.

The forty-first annual fair of the Delaware County Agricultural Society was held in the city of Delaware on the 28th, 29th, 30th and 31st of August, 1888.

This fair was undertaken by the Board of Managers of the society with fear and trembling. Realizing our close proximity to Columbus, and the holding of the Ohio Centennial there with, its great attractions, and the attractions of the Cincinnati exhibition, both of which would draw largely from the people of the surrounding county, the Board naturally hesitated as to the expediency of holding a fair this year. After several meetings had been held and the matter thoroughly discussed, it was decided that for forty years the society had held its annual fair, and it would not do to break the record at this time, so the forty-first fair should be held, even if it should not prove a financial success.

The result proved that it was not a financial success, but as an exhibition it was a success far beyond expectations, the entries being considerably ahead of the year 1887.

The condition of agriculture in Delaware county is progressive.

The farmers and stock-breeders of the county keep well to the front in their vocations, adopting the latest machinery for work on their farms, securing the best breeds of stock for stocking their farms, and for their mutual improvement and exchange of thoughts and ideas they have, besides the Agricultural Society, the Farmers' Institute, the Grange, the Horticultural Society and the State Breeders' Association, all of which have a fair membership, and in addition to these, after the harvests are gathered and the toils of summer are over, the basket picnics and the harvest-homes are held, at each of which some important farm topic is discussed and social cheer enjoyed.

Delaware county may be classed more properly among the stock or grazing counties than among the grain producing counties.

Stock-raising, at present, seems to occupy the attention of our farmers.

The horses bred and raised in Delaware county have a reputation that bring many purchasers for them from all parts of the country, and the horse-breeders of the county, knowing the value of this reputation, and to sustain it, are importing the best French and English horses and mares for breeding purposes.

In cattle, Delaware county has many fine herds of Short Horns, Devons, Holsteins, Jerseys and others.

The polled breed of cattle are beginning to attract some attention, and a very fine herd of Red Polled has just been imported by Mr. V. T. Hills, of Delaware.

Sheep-raising is again receiving attention in the county, and a large importation of Shropshire sheep has recently been made by C. Hills & Son.

Many fine flocks of sheep are within the county, the more prominent of which are the flocks of Merinos of R. K. Willis and J. A. Bell, the long-wools of Frank Fry, the Shropshires of Jones Brothers, the South Downs of T. C. Jones & Son, and the Oxford Downs of B. N. Ward.

Of swine, the principal breeds of the county are the Berkshire, Chester Whites and Poland-Chinas.

The principal crops of the county are corn, wheat and oats.

The season of 1888 in this vicinity was remarkable as a fruit season, it having been many years since fruit of all kinds was raised in such quantities and ripened with such perfection as this year.

ERIE COUNTY.

The season of 1888 was a fairly prosperous one for nearly all kinds of products of the field and orchard. The yield of wheat as a whole was a good average. Some of our growers had large yields, running as high as 35 to 40 bushels per acre for single fields, while others lost from winter-killing on soil heaved by the severe winter. The quality was excellent, the berry hard and firm, and very little graded below No. 2 in the markets. There has been but little, if any, increase of our wheat acreage. The continued low price prevents it, and farmers in this county are getting the best net results out of diversified agriculture. The new wheat plants looked unpromising in the early fall, because of the dry weather, but the open, wet winter thus far has greatly improved their condition, and the fields are generally looking fine.

CORN.

Farmers said their corn crop was better in 1888 than for many years. The yield was unusually large, and reports came from many quarters of carefully measured yields running as high as 100 to 150 bushels to the acre. The acreage of corn was fully up to the standard, and the quality of the crop was never better.

OATS

Were not an extra crop. Hail-storms in some parts of the county did much damage, especially in parts of Margaretta, Perkins, Huron and Vermillion townships. Other crops also suffered. The yield for the county was, if anything, a little under the average and the quality below par.

POTATOES.

This is a growing industry in this county, and every year adds to our potato acreage. Increased facilities for handling the crop, and improved machinery and appliances to save labor are largely doing it. The crop of 1888 was only a fair one and did not yield up to expectation, but even at the low prices on the average yield for the same seasons, the crop has paid better in net returns than wheat, and our potato acreage is certain to increase.

BARLEY.

This county raises in some portions good barley, and the yield was first-rate and the quality exceptionally good.

There is but little rye sown in this county, and it is not a growing industry.

FRUITS.

The apple crop was unusually large in yield, but the quality was not up to average. Too much imperfect fruit, and prices were low. Winter fruit brought in the orchard from 75c. to \$1.00 per bushel, the latter figure for choice hand-picked.

The peach crop was remarkably large, both of early and late varieties, but the latter fell some short, owing to the long dry weather, the fruit not filling as well as had been anticipated and the quality correspondingly poor. The prices were for the most of the crop low, owing to the large yields in all fruit sections, and the net outcome was a disappointment to many growers. The yield of small fruits was generally good. Early frosts gave strawberries—which are quite extensively and profitably grown in some parts of this county—a backset, but later they came on well, and prices were the best in a number of years. The acreage for 1889 has been increased. The honey industry has been growing in our county, and as fine quality is hived as goes to market. It is profitable to those who make it a business and give all the time needed.

LIVE STOCK.

Farmers are becoming more and more stock men. The business of raising better grades of horses especially has materially increased in this county of late years, and the past year has been one of still greater activity. Farmers are raising blooded horses, both for the road and the general market. Good horses, both in the heavy and the track breeds, find ready sale. The thoroughbred cattle men have, in common with all others throughout the country, not realized the past year on their high-priced stock. The business at the prices has been overdone, and the steady scaling down

in prices of fancy stock has fallen heavily upon some dealers who put a good deal of money in their herds during the past three or four years with the expectation of realizing large returns.

The sheep industry in this county is undergoing a change. The fine-wool merinos are giving place to the coarser wool breeds, medium Delaine shearing grades having the lead. Our flockmasters are giving up growing sheep solely for their fleeces. The price of wool being too low to leave a profit on them, they are getting into the coarser wools and counting on the mutton for the market to help them out. The swine industry was only moderate; the stock of hogs was short, notwithstanding a higher scale of prices was paid all the fall.

The demand for poultry and eggs invites more attention to that branch of farm products as one of its most profitable in proportion to the capital and labor required. All the year round poultry and eggs find quick sale in the markets at paying prices, and the demand increases far faster than the supply. The same is true of butter, and farmers in this county are paying more attention to the dairy with very satisfactory results.

THE ERIE COUNTY AGRICULTURAL SOCIETY

Had a prosperous year, and its thirtieth annual fair was one of the most successful in some respects in the history of the county. The accompanying tabular statements give all the receipts and disbursements in detail. The society did a business aggregating \$7,600.00. The receipts of the fair alone were \$5,151.67, and from the two annual harvest picnics (one being held in each half of the county, the better to accommodate all the people of the county), \$998.28. The society, after paying all expenses of the year, paid \$2,460.14 for new improvements, and at the close of its fiscal year had a debt of but \$278.57. A new nine-foot fence, made in the most thorough manner, was built the past season, enclosing the grounds on three sides. The race-track is being put in fine order this winter, at a cost of about \$900, receiving nearly 1,000 loads of earth, and being regraded and made one of the best half-mile tracks in the country. The society has paid for land and improvements, since the purchase of the present fair grounds in Sandusky, May, 1864, \$43,372.93, and in premiums alone, awarded at its fairs, \$53,823.48. It has found a liberal, progressive policy, both in premium offerings and programmes of attractions at the fair, to pay. The management has always relied upon the people to respond with corresponding liberality in their patronage, and has never been disappointed. Every dollar made each year is invested in new improvements, larger premiums, and greater attractions, and the results have abundantly proved the wisdom of such a policy in the management of county fair associations.

C. H. ROCKWELL, *President.*

FAIRFIELD COUNTY.

The principal crops raised in the county are wheat, corn, oats, barley, potatoes, and meadow and clover hay.

The winter of 1887 was severe, the spring cold and backward, and for these reasons the wheat was not much of a crop, but the prospects are good at this time for a good harvest the coming year. So far we have had a very extraordinary winter. The corn crop was above the ordinary this year. Some of the late corn was caught by the early frosts, but not to any great extent, and the yield per acre this year was above the average in this county. The potato crop was a good one, and made a good yield. The clover and meadow was not so good, but what there was was of a good quality. The past year was an exceptional year for fruit, and the crops of all kinds were good. I don't think this county ever seen as good a year for apples as it did this, and every place an apple tree was to be seen, there apples could be found in great quantities.

The live stock of all kinds have suffered little, if any, from contagious diseases during the past year. Thoroughbred animals are becoming more and more common in our county, and we now have some of the finest herds of cattle to be seen in the State; and our county has some of the finest imported draft horses the markets can afford. And we are not behind in the other breeds, for we have some of the finest roadster and general purpose stallions to be had in the State, and by these means we are year by year bettering our class of roadster and general purpose horses, which class of horses are not bad, as they are. We have some of the best herds of hogs to be seen anywhere in the State, especially the Poland-China, which is raised and bred more extensively than any other breed in the county.

The Fairfield County Agricultural Society has just passed through the most unsuccessful fair it has ever had since its existence, in the way of finance, for it commenced raining on the second day of the meeting, and continued without ceasing during the entire meeting, but the display in all the departments were up to the average, and the entertainment was gone through with as though the weather was the best; and the Board paid out \$7,000 in premiums and purses—all that was contested for—and paid it all on the last day, and nothing was declared off or continued, for one of the first rules and principles of this society is to pay all its awards on the last day of the fair, and to pay them in full, and no scaling, and this is lived up to to the letter; and no person went away from the grounds saying that the society owed them a cent for any premium or purse he had been awarded; and the society has long held to this rule, and still

intend to do so, in rain and sunshine. This rule places a great amount of work on the officers of the society, but they do it willingly for the accommodation of all persons who bring their stock and other articles to exhibit to help make up our fair.

Visitors pronounce our fair grounds the most convenient grounds in the State, while grey-haired turfmen, who have seen all the prominent race-tracks in the country, say that we have a perfect half-mile track, and one that the citizens of old Fairfield should be proud of.

Our farmers are using more and better machinery on their farms year by year, and they always buy the best the market offers to them. The social interests and home life of our pioneers are remarkably well maintained, and the standard of general intelligence and citizenship advanced as these are fostered, and a drive through the farming portion of our county will bring to sight some of the finest farm mansions to be seen in any foot of this great State.

W. T. McCLENAGHAM, *Sec'y.*

FULTON COUNTY.

Fulton county is the unfortunate possessor of *two* fair associations—the County Society, and an Independent Association on the stock plan. Of this condition the great majority of the active, thinking and well-wishers of the agricultural and business interests of the county are not proud, but wish it were otherwise. Many of our best and most useful citizens would be glad to see them united into one—a County Agricultural Society, owned and controlled by the people.

Although both of these societies are well patronized and offer reasonably fair premiums, and pay all expenses in full, it is nevertheless believed that our industries of all kinds would be better promoted, and a more healthy social feeling stimulated, and much greater good accomplished under one management than under two. Location is the bone of contention—the rock upon which we split—with a few other minor differences. The County Society seeks to promote the social and moral, as well as the agricultural and other business interests of the county, and in this effort the board of managers have the support of the patrons. Side shows of doubtful propriety, all games of chance, intoxicating beverages, and everything of a demoralizing tendency are scrupulously excluded from the grounds. By the accompanying report of the treasurer and secretary it will be observed that the last county fair was a decided success, and which would also indicate a good attendance. The earnest work of the board of managers was well seconded by the people, both in respect to exhibits and

attendance, resulting in one of the best and most successful fairs ever held in the county.

The society is upon sound and safe footing, owning, free of debt, their beautiful grounds of forty acres, well improved, and with sufficient and convenient buildings for the accommodation of exhibitors and visitors.

The farmers' institutes, which have annually been held in the winter season now for nine years, still continue to increase in interest, the last having been one of the best, resulting in pleasure and profit to all in attendance.

We have now in the county two well established and prosperous Normal schools or colleges—one at Wauseon, the county seat, and one at Fayette, a beautiful and well ordered village in the north part of the county, and upon the Lake Shore railroad, and two miles from the Wabash road. Each have, during the past year, erected and dedicated new and substantial buildings, with all the modern improvements, sufficient to accommodate five hundred students each. These institutions now have an enrollment of near three hundred students each, many counties of our State, and several other States of the Union and Canada being represented in the attendance. They furnish a fine opportunity for the proper education of our young.

The past has been a very good and successful year for the agriculturists of the county, the crops averaging well in yield, and fair prices prevailing.

Wheat—The crop for 1888 above an average.

Corn—An average in quantity, but inferior in quality, caused by the extreme dry weather in the months of July and August.

Hay—A little below average in amount, but excellent in quality.

Clover Seed—An unusually large crop and good paying prices.

Oats—About 20 per cent. above an average.

Potatoes—Moderate crop of excellent quality.

Can note some continued improvement in stock, especially in horses and sheep, the more heavy breeds of horses, and the Merino breeds of sheep prevailing.

The cattle interests perhaps a little on the decline. Milk breeds are now preferred to the beef producing breeds.

Hogs—The various breeds kept up to their high standard.

Stock of all kinds *free* from disease.

Economy, prudence and judgment in the purchase of household and farm supplies, good care of the same, good judgment and practical thought in care of our soil, better farming, less hard work, more leisure and recreation, and a more practical and better education for our children, with improvements in our homes and surroundings, and more social inter-

mingling with each other, are some of the lessons of farm economy being taught by our Granges, Farmers' Institutes, Horticultural Societies and Farmers' Clubs.

Gravel roads are coming in demand, one of the improvements now most needed to make Fulton one of the best counties in the State in which to have a home.

GALLIA COUNTY.

Gallia county lies in the south-eastern part of the State, with its greatest length shedding its waters into the great Ohio river, along which is found its most valuable land, scarce an acre of which is not under tillage. The surface is so hilly that but one-half of the quarter million acres are cultivated. The forests are generally hard woods. The soil is a sandy loam generally, while the hill-sides of the interior have clay of such character that produces a good quality of wheat, which cereal occupies one-half of the cultivatable area. Corn, hay, potatoes and oats are next in value in the order given. But few farmers adopt specialties, mixed crops being the rule.

The old hills of Gallia which skirt La Belle Ohio, are quite picturesque, but, together with quite all the hills of the county, are valuable for their stores of coal, iron and tin—tin, did we say? There is in this county and Mason county, W. Va. (across the river), millions of tons of ore, from which you can extract a whitish metal, equal to the best jeweler's solder, and which has been pronounced by a dozen chemists to be tin with a trace of silver. Other chemists have said it is not tin, and the dispute is unsettled, while the natives extract the metal over a blacksmith's fire and build castles of wealth.

Of the more than 30,000 inhabitants of Gallia, three-fourths are dependent on the soil for subsistence, while the remnant look to the prosperity of the farmer for their prosperity. We are morally inclined; are not economical in churches and school houses, and are fairly industrious. Ninety-nine years ago a band of French emigrants landed at the present site of Gallipolis, the county seat, and Col. Robert Safford, later companion of the noble Daniel Boone, sprang ashore and cut the first tree. The little band were principally skilled artisans, but they threw up the virgin soil, and brought about them plenty, a quiet fireside and a pipe. To-day, on much of that land, resides their hereditary foe, the German, and when his red wagon goes to the county seat it contains, besides produce, a healthy loan for his less thrifty neighbor. The celebration of the centen-

nial of the settlement would be a fitting time to compare the methods and progress of agriculture, and it would be the more interesting if it but had a better application.

Last year witnessed the establishment of the county institute in our midst, with our hustler of the State Board, Mr. Bonham, as the inspiring spirit. The interest was more than ordinary, and the second of the series will be met with the welcome its importance deserves.

The unusual rainfall of the season of '88 brought with it luxuriant vegetation and increased fruitage, but it rendered the keeping qualities of small fruits less stable. Apples proved so abundant as to be a non-profitable crop, the rates of expense of handling to selling price being too large. The peach was in plenty, cherries were abundant and berries were a drug in the market. Of the leading cereal the production was fair, the leading varieties being Mediterranean and Fultz. Many farmers complained of the ravages of the chinch-bug, which fed on the life-blood of the wheat, and after harvest migrated in countless millions to the corn, leaving that thrifty stock as a blackened monument to the folly of man's hopes. But the crop, notwithstanding, was a large one—it was a Pharaoh year. A farmer near the village of Porter, this county, went to the fields with his gun, and as the product of his skill disclosed a few quail, the crows of which he opened to his neighbors. In all were found the chinch-bug, one crow containing seventy. That neighborhood is a unit in war upon the sportsmen.

Potatoes proved an excellent crop in quantity, with noted deterioration of its quality. The shippers of our county leave annually with about fifty thousand dollars worth of produce, principally of this vegetable, which finds a ready market in the South.

The improved hay bailers and their increased number give encouragement to hay-growers, though it does not seem to lessen the price of this valuable feed.

The interests of live stock are constantly augmented by shrewd owners of pure-bred sires. Undoubtedly the most active conservator of the horse and cattle interest in our county is Mr. C. D. Bailey, of the State Board of Agriculture. Beef cattle are principally sought, though our creamery is slowly fighting its way to a permanent success. In hogs and sheep we have several breeders who have established reputations for handling successful strains of their respective specialties. During the season we lost, by death, a noted breeder and patron of agricultural fairs—Mr. John J. Maxon. Mr. Maxon's career was unique, in that he traveled from fair to fair, his prices bringing a handsome income and many buyers. So valuable was he to the large fairs of interior Virginia, that he was annually

complimented with free railroad carriage for self and stock over the several lines he traversed. He was never overmatched in his exhibits.

Our annual county fair was held as usual—the thirty-second exhibit. It was not a success. The fates willed otherwise. The entries were cut short by anticipated bad weather, though our floral hall was filled by our usual display of the products of the farm, the artisan, the needle and the brush. A number of awards were made in these classes, but the flooded grounds did not permit other committees to work, nor did they invite the rural patron with his desired admission fee. Ten weary Directors, though, pranced about for three days, with a subdued smile, but quiet determination to never give up the ship. The society is now compelled to lease its grounds for exhibition purposes, the old Fair Grounds Company having purchased them and recently resold them to private citizens, who will try the experiment of holding a private fair—or more properly speaking, a fair for individual gain. If this should tend to increase the interest in agriculture, no one would be more pleased than the Agricultural Society, who have tried to please without offending the moral sensibilities.

P. S. WALL, *Sec'y.*

GEAUGA COUNTY.

The Geauga County Agricultural Society held its fifty-sixth annual fair at Burton, Geauga county, September 18, 19, 20 and 21, 1888.

Stock entries were very large, all the stalls, stables and sheds being full.

The halls in the different departments were filled to overflowing, the management having to press into use a large tent to receive the overflow.

The weather was fine and the attendance was larger than any former year.

All classes of horses were represented. The showing of cattle was good.

Sheep were represented in all classes. There was a large display of swine of different breeds.

The poultry department was well represented, and as fine as any year previous.

Grain and vegetables better than the average, and all space allotted them more than filled.

Fruit had a fine representation, but hardly up to our previous records. Agriculture is the leading interest in our county.

The farmers, as a rule, are energetic and enterprising. Wheat crop was below the average. The corn crop was one of the largest ever known in this county.

Potatoes, large crop and small price. Oats, good. Hay, light crop. Owing to late rains, fall pastures were excellent, and late dairying very profitable to farmers.

GREENE COUNTY.

The forty-ninth annual fair of the Greene County Agricultural Society was held on the beautiful grounds at Xenia, September 5, 6 and 7, 1888. The fair was pronounced the most successful one held for many years, in point of exhibition. The weather was beautiful, excepting on the last day a heavy rain fell, seriously interfering with that day's attendance, and as a consequence the receipts were not sufficient to meet the expenditures. The exhibit of horses was very large and of superior quality. The entries in this department numbered over two hundred, consisting of very fine draft, general purpose and roadsters of all ages. Among them were a number of imported draft. In cattle, the Short Horns, Jerseys, Devons, Holsteins, Herfords and Polled breeds have each their friends, and bid fair to become quite common and a source of profit to those who handle them. The exhibit of sheep was larger than that of the preceding year, and consisted of fine-wools, long-wools and downs. We have both the large and small breeds of swine, but the large breeds generally predominate. The hog-cholera has prevailed to a large extent in the county.

The poultry show was good, but comparatively small. The display of farm products was large and of an excellent quality. The samples of wheat, corn, vegetables, etc., were of the finest quality, and could not easily be excelled by any county in the State. Fruits were shown in large quantities, the crop being a very large one. The exhibit of horses was fair and of superior quality and beauty. The entries in the department of pickles, preserved jellies, jams, etc., exceeded over eight hundred, and were of the very finest quality. Nor were the ladies behind in the display of fancy articles and domestic manufactures, as more than six hundred samples of their handiwork were spread out for the admiration of the crowds who visited them.

Crops—The wheat crop was, on an average, very short last harvest, though some farmers report very good crops, while others did not have one-third a crop. The quality was poor. The oats crop was the best for years, and was an increased acreage. Rye and barley, none of consequence raised. Hay, an average crop and of fine quality. Corn was an excellent crop, perhaps the largest raised for twelve years. The fall being a good one for work, the crop was cribbed early; quality good. Apples plenty in localities, and a good crop. The peach crop was the largest crop for

eight years, and of good quality. Plums, about half a crop. Pears, a good crop; so abundant that there was no sale for them.

Strawberries—In abundance and of good quality.

Blackberries—Not plentiful and of poor quality, generally.

Raspberries—Plentiful, but not of the best quality.

Vegetables were abundant and of good quality.

The low price of farm products teaches our people the need of strict economy in the purchase and use of all necessary articles, and the demand of a better system of agriculture in all its departments. The land must be put in better and more productive condition by underdrainage, and better and more perfect cultivation. Stock of all kinds must still be further developed and improved, better judgment used in the purchase of farm implements and the care of the same; in short, everything pertaining to agriculture must be brought up to the very highest standard of perfection and economy. The school interests of the county are in a prosperous condition, and almost every district in the county has a nice brick school house with all the modern improvements.

GUERNSEY COUNTY.

The eleventh annual Guernsey County Fair was held at Washington, Ohio, September 25, 26, 27 and 28, 1888. The attendance was larger than ever before, and the financial condition of the association will compare favorably with many of the larger fairs.

The Board this year added another class in the horse department, being "Light Harness and Saddle." All the classes were well filled. Competition being lively in the draft class, more improvement has been made in the breed of horses in our county during the past five years than for twenty years previous to that time.

In the cattle department we had herds in the Short Horns, Devons, Holsteins and Jerseys. The show of cattle was never excelled in quality as well as in the different breeds.

The exhibition in the sheep ring was quite good, and the competition in the different classes was better than for a number of years. Guernsey should certainly be proud of her sheep, as she has the finest that can be produced.

The hog show was of the white and dark breeds, and was not quite as large as last year. We hear of a little cholera in the county, but as yet not spreading much.

The display of apples, peaches and vegetables of all kinds never was

surpassed at our fair. Floral hall was filled with the finest needle work, and canned fruits, jellies and preserves were on exhibition.

This year Prof. R. J. Hawkins gave us a balloon ascension with parachute descent. He landed with his parachute about three miles from the fair grounds. Our patrons were more than pleased, as it was a grand success.

The wheat crop of the county was not as large as usual, and not as many acres sown this year as last. Phosphates are generally used in sowing wheat, as our farmers have found from experience that it pays.

The corn crop was larger than for a number of years, although owing to the wet fall, considerable of it was soft. The hay crop was short; quality first-class, and oats were of good quality and about an average.

Fruit of all kinds was in abundance, and a large amount has been dried, as a number of evaporators run both day and night in different parts of the county. Thousands of bushels of apples have been shipped to western markets, and we venture the assertion that no finer or better apples are raised in the State than in Guernsey.

Lands in our county are gradually improving and are very cheap, considering the advantages to be had, as we have plenty of coal, and there is no finer pasture lands for sheep, and taxes are as low, if not lower, than any county in the State.

In closing this report, we will again refer to the general improvements of the county. Natural gas is being used at Cambridge and Quaker City for light and fuel; at Cambridge alone about seventy miles of pipe has been put down, and as yet natural gas is only in its infancy with us. Our coal lands are being better developed. A new railroad is now in process of construction through the county, which, when completed, will run within ten rods of our fair grounds. This will be a great advantage to the county, as we will then have railroads in all sections. Lands will surely advance, our mineral resources will be opened up, our tax duplicate enlarged, and our whole county will certainly have cause for rejoicing.

V. D. C., *Sec'y.*

HAMILTON COUNTY.

The county of Hamilton having within its boundaries the city of Cincinnati and its suburbs, consisting of towns and villages, along all the lines of railroads centering in the city, is from necessity not an agricultural county. The land not lying within the city and villages is for the most part occupied and used as gardens or dairy farms. And yet the valleys of the Great and Little Miami rivers, the Whitewater river, and

the Mill Creek valley comprise as fine farming land as can be found anywhere in the State of Ohio.

This locality suffered considerable in the early part of the season from drought, but was blessed with abundance of rain throughout the latter part of the season.

The wheat and barley crops were good; oats, medium; hay, light; corn, large crop, but inferior quality, owing to the late season and early frosts. Early potatoes a failure; late potatoes very good crop, and fruits of all kinds good crop, the best for many years.

Considerable interest is being manifested in the breeding of fine stock of all kinds, and especially cattle and hogs, and this seems to be growing steadily each year. There are several fine herds of imported and thoroughbred Holstein, Friesian and Jersey cattle within the county, and quite a number of farmers are extensively engaged in breeding and rearing thoroughbred hogs, the popular breeds being the Poland-China, Berkshire and Jersey Reds.

The annual fair held at Carthage August 21, 22, 23, 24 and 25, was a success in every respect. Premiums offered and awarded were at least 25 per cent. more than former years, and the attendance and receipts increased in like proportion.

The county expended the sum of ten thousand dollars in the erection of an elegant and commodious grand stand, which, in connection with the numerous and substantial structures, acquired by many years of time and an outlay of many thousands of dollars, completes the fair grounds of Hamilton county almost to perfection, and making them a park of which our oldest cities might well be proud.

HANCOCK COUNTY.

The thirty-seventh annual fair for this county was held upon the grounds of the society at Findlay, on Wednesday, Thursday, Friday and Saturday, September 12, 13, 14 and 15, 1888, and while not the success financially that the managers had hoped for, yet the receipts compared favorably with the receipts of former years, and were sufficient to pay the premiums, the current expenses, the attorney's fees, etc., in condemnation suit brought by the N. Y., M. & W. R'y Co., the debts carried over from last year, and leaving a balance on hand.

HORSES.

There was a large increase in the number of entries in the several classes of horses. Our farmers are giving a great deal of attention to the

rearing of good horses, especially draft horses. A very fine lot of horses was shown this year.

CATTLE.

The exhibit of cattle in the several classes was not so large as last year. Among those exhibited were several very fine herds of Short Horns, Devons, Jerseys and Grades.

SHEEP.

In all classes of sheep there were seventy-five entries, and of these there were some very fine specimens of Merinos, but the greater number were of the larger breeds, chiefly Shropshire Downs and a finer lot of sheep was never shown at our fair.

SWINE.

There was a good exhibit of swine, though there were not so many entries as in former years.

POULTRY.

The display in the poultry department was very fine—by far the largest and finest display ever made at our county fair.

The display of farm products, canned fruit, etc., was very good.

The display of grain, seeds and vegetables was not so large as at former fairs, due largely to the fact that our fair this year was held several weeks earlier than heretofore.

In the class of machinery and manufacturers' products we had a very good display.

CONDITION OF AGRICULTURE.

The season of 1888 was favorable for all crops except wheat. The wheat crop was rather light for this county.

The corn crop was probably as large as any ever raised in this county.

The oats crop about an average.

Potatoes about an average crop.

Fruit, a good yield.

The hay crop will compare very favorably with the yield of former years. Large quantities of hay are baled and shipped out of the county each year.

The shipments out of the county of grain, seeds, hay, wool, poultry, butter, eggs and live stock are annually very large.

The discovery of gas and oil has wrought a great change in this county, and Findlay, the county seat, is fast becoming a great manufacturing

center, and now has a population of about twenty thousand inhabitants. The amount annually received by our farmers as royalties and rentals on gas and oil is very large, and adds very materially to the wealth of the county.

HARDIN COUNTY.

The thirty-fourth annual fair of the Hardin County Agricultural Society was held at Kenton, O., September 4, 5, 6 and 7, 1888. The exhibits in most departments were up to the usual standard, and in the horse and swine department they were unusually large.

A cold rain the last day of the fair reduced the gate receipts below the amount received last year.

Our farmers are taking more interest every year in the improvement of their stock, all owing to the fair. There are not many counties in Ohio that can show as many imported and thoroughbred horses as Hardin county can.

Geographically Hardin county lies along the edge of the two great water sheds of North America, namely, that of the Mississippi Valley and that of the great lakes.

The surface of the county is mostly level, and the twenty-five thousand acres of marsh land that a few years ago was considered worthless, to-day, by a good system of drainage, is the richest and most fertile land in the county. The soil in general is black loam and sandy clay. The county has 295,297 acres of land.

A. W. SQUIRE, *Sec'y.*

HARRISON COUNTY.

The Harrison County Agricultural Society held its forty-first annual fair at Cadiz, Ohio, October 2, 3, 4 and 5, A. D. 1888. The first two days of the fair were very rainy; the result was that very few persons attended. No gate fee was charged. A very moderate attendance on the third day; a very good attendance on the last day. In consequence of bad weather, our finances were very short. We were able to pay only the incidental expenses and forty per cent. of the premiums offered. Our exhibition, however, was good if the weather was wet. Every department was pretty well represented. We think a better show of horses was never on our fair grounds; nearly every class of horses was represented. Our show of cattle consisted of Short Horns, Jerseys, Holsteins, Polled Angus and Grades, a

very fine display indeed. Hogs consisted of Poland-China, Chester White, and Berkshire. The sheep department was made up of Thoroughbred Spanish, Thoroughbred Blacktop Spanish, and Thoroughbred National Delaine sheep, and also unregistered sheep of each of the above classes, also several classes of very fine mutton sheep. The ladies' department was also very well represented in all its branches. For the getting up of those displays the ladies deserve great credit. Machinery department was good, from the corn-sheller to the traction engine; almost every variety of machinery was on exhibition.

Our county is an agricultural county, the chief products of which are wheat, corn, oats, hay, potatoes, etc. It is also well adapted to the raising of the different kinds of fruits. This county lies within twenty miles of the Ohio river, bounded by Jefferson on the east, Jefferson and Carroll on the north, Tuscarawas and Guernsey on the west and Belmont on the south. This is a small county, containing only 405 sections of land. It is generally hilly, except on the creek bottoms. The hills are principally underlaid with coal and limestone. This applies more particularly to the eastern part of the county. The hills in the western part are filled with good sandstone suitable for building purposes. Near Tippecanoe, on the Wheeling & Lorain R. R., there is a sandstone quarry that is equal in quality to almost any quarry in the State, Berea not excepted. There is a dividing ridge running through this county, from north to south, leaving about one-third of the land on the east and two-thirds on the west of this ridge. The waters rising on the east and west of this ridge run different directions. Still-water on the west runs to the Tuscarawas river, and Short Creek on the east runs to the Ohio river. Some of the kinds of timber found in this county are poplar, black walnut, chestnut, hickory, locust, cherry, beech, white oak, black oak, red oak, swamp oak, ash, linden, etc. Good and substantial school houses are in every part of the county; churches of almost all denominations are scattered over the county. A person coming to this county to make it a home can almost always have his choice of churches.

JACOB JARVIS, *Sec'y.*

HIGHLAND COUNTY.

The Highland County Agricultural Society held its sixth annual fair in Hillsboro, on August 7, 8, 9 and 10, 1888, and the meeting was by far the most successful one of its history, both in attendance and in show, and the board closed the year in a sound financial condition.

The corn crop in the county was far above the average, but that planted late was inferior in quantity.

The wheat crop was unusually good where fertilizers were used, but on land where no fertilizers were applied, almost a total failure.

Oats, much above the average and superior in quality.

The timothy crop was very large, but the clover yield, on account of the drought the year before, was quite light.

The potato crop was about an average, the early some above, but the late slightly below the medium.

Apples, peaches and all kinds of small fruits were never more plentiful or of a finer quality. The supply so exceeded the demand as to reduce prices to the lowest figures ever known in this county.

Highland county still holds her good reputation for the quantity and quality of her cattle, hogs, sheep and draft horses, especially the latter, of which we can boast of some of the finest in Ohio. Owing to the fact that feed is so plentiful and cheap, all stock is being well fed and presents an excellent appearance.

Taking all in all, the year has been the most prosperous for our farmers that they have experienced for many years.

JOHN S. JOLLY,

Secretary Highland Agricultural Society. per M.

HILLSBORO, OHIO, January 14, 1889.

HOCKING COUNTY.

LOGAN, OHIO, January 14, 1889.

To the Honorable State Board of Agriculture, Columbus, Ohio:

GENTLEMEN: The thirty-fifth annual fair of the Hocking County Agricultural Society was held on the new fair grounds, on the 3d, 4th, 5th and 6th of October, 1888.

The number of entries was fully equal to that of any previous year, and but for the inclement weather, it would have been the most successful fair ever held in the county.

The receipts from all sources amounted to \$2,040.55. The amount paid out for premiums and current expenses was \$2,060.93, thus leaving a small deficit to be made up by the society. Two years ago the society purchased new grounds, and every effort possible is being made each year to erect substantial buildings and beautify these grounds.

This year the society erected a commodious floral hall, which added

much to the appearance of the grounds and afforded ample room to exhibitors.

The floral department was well filled with rare and choice flowers, and in the fruit and vegetable department was seen one of the finest exhibits ever made in the county.

The interest manifested in the success of the society by the citizens of the county is evidently on the increase, and a decided improvement may be seen in our fairs from year to year.

Our farmers are becoming alive to the improvements that are being made in agriculture and stock-raising.

Much attention is now given to the use of fertilizers, especially in the culture of wheat; and as a result, the yield per acre is largely increasing. Wherever fertilizers were used last year, a greatly increased yield was obtained, while on land equally good naturally, where no fertilizers were used, failure resulted.

The raising of fine stock of all kinds is also receiving considerable attention.

The leading department is now, perhaps, the production of heavy draft horses. Some very fine animals of this kind have lately been brought into the county, and it will be but a few years until our draft stock will be greatly improved.

Advanced ideas as to feeding and fattening stock are being adopted by a number of our thoughtful and enterprising young farmers, and the *silo* and the dehorning of cattle are to be tested in the near future.

Our people are awake, and Little Hocking will soon be abreast with the most advanced counties of the State.

J. M. FLOYD, *Secretary.*

MAYNARD POND, *President.*

HOLMES COUNTY.

The twenty-fourth fair of the society was held September 25, 26, 27 and 28, 1888, at Millersburg, Ohio.

The exhibits were among the largest ever shown on the grounds. Every department was well represented. The horses were the finest and the best that have ever been exhibited. Cattle were excellent; such as Short Horns, Jerseys and Holsteins. Sheep exhibit was the largest ever shown at the fair; principally of the long-wool class. Swine was as good as could be found in the State. There were two fine displays of poultry by J. M. Yoder and R. T. Beum.

The floral hall was well filled with flowers and fine tropical plants. Also fine display of ladies' handiwork.

The mechanics' hall was filled to overflowing of man's handiwork; also in the same hall the best display of fruit of all kinds, green, dried and canned, that has ever been produced on the grounds.

Good order prevailed during the fair. Everybody well pleased. The exhibition in the speed ring was the best the people of the county have ever been favored with.

The agricultural interest of the county never was in a better condition than it is at present. Eighteen hundred and eighty-eight has been a year of plenty. The farmers are realizing the importance of having the best of machinery and the best of stock, and are using the best available means toward keeping their land in the best of cultivation. The great source of this awaking is due to the agricultural fairs and the farmers' institutes. Every farmer is beginning to inquire: "Are we going to have an institute?" The society has become a little embarrassed this year by having debts increased. This being Centennial year, was somewhat a detriment to the county fairs, causing loss of membership also. Our wheat crop on bottom land was fair, on upland was poor, principally caused by the great drought of 1887 in not getting sufficient growth in the fall. Hay, principally light; oats, fair yield; corn, a good crop; potatoes, good; pastures were good; apples, peaches, plums and cherries were fine; pears, a light crop; strawberries, a fair yield; raspberries and blackberries, a very fine crop; grape, a fair yield. The crops have all been harvested with little damage.

HURON COUNTY.

To the Ohio State Board of Agriculture:

The year 1888 has been of more than average fruitfulness and prosperity to the farmers of Huron county.

Notwithstanding the drought during a portion of the summer, the corn and wheat yield has been a full average, and a good crop of grass and oats were secured in excellent condition.

The potato crop was very fine, and fruits of all kinds were plentiful.

The dairy products have been satisfactory, and good prices have prevailed.

It may be safely stated that the agriculturists of Huron county are in a better condition, generally, at the close of the year 1888 than they have ever been before.

Handsome improvements in farm buildings are noticeable in all parts of our county, indicating thrift and prosperity.

Better methods of cultivating the soil prevail than heretofore. The machinery in use is abundant and of the latest improved patterns.

The value of fertilizers is receiving more attention through discussion and investigation than ever before, and nearly all our farmers are experimenting and testing in this direction. More and better grades of fertilizers were used in 1888 than ever before, and generally with quite satisfactory results.

The tillage of our soil and the care of growing crops is receiving more thought and intelligent attention, and as a result we have much better harvests and a happier condition of things among our farmers.

The interests of Huron county are somewhat diversified, but the preponderance of our wealth and industry is with our agricultural population; and the general prosperity of our communities are very largely dependent upon the farmer. His success makes everybody happy, and his failure brings gloom to all our business circles.

A good state of health and a feeling of contentment and happiness has pervaded all classes of our people during the year; and we may truly observe that no portion of the earth presents more attractions or offers more desirable conditions, all things considered, for the abode of mankind than does this little spot of earth, known as Huron county.

THE FAIR OF 1888.

The thirty-fourth annual exhibit of the Huron County Agricultural Society was held at Norwalk, on September 11, 12, 13 and 14, 1888.

The dry weather which prevailed so extensively for several weeks before made the dust almost intolerable, and the scarcity of water proved a serious inconvenience to the managers and to the patrons of the fair.

The exhibits in all departments were very fine, and barring the clouds of dust, which prevented thousands from attending, the exhibition was a success.

The show was universally pronounced the best ever given.

The attendance was not nearly as large as in 1887; consequently the receipts fell short of expectations and left the treasury deficient about one thousand dollars.

The society is in good condition, however; harmonious, hopeful, and with excellent future prospects.

In conclusion allow us to say that we regard the agricultural interests of Huron county as in a gratifying and satisfactory condition, with excellent prospects for future growth and greatness.

JEFFERSON COUNTY.

The crops in this county this year were rather light, taken as a whole; the wheat crop not being more than a good half-crop in quantity, but the quality of the grain was very fair. The oats crop was fair; about two-thirds of a good average yield. The corn crop was unusually good, but owing to the lateness of the season, it did not mature as well as it does some years, there being considerable soft and unmerchantable corn. The rye and barley crops were also light; these, however, are not extensively cultivated in this county. The crop of potatoes and other vegetables, as a rule, were very good. Vegetables are not cultivated extensively, except in that part of the county adjacent to the river. Owing to the excessive drought of the summer, the crop of hay was very light, the lightest, perhaps, for many years.

Live stock of all kinds has done well during the year. More attention is given to the raising of sheep than any other kind of stock. However, there are a good many horses, cattle and swine raised. Of the kind of horses most sought after, are the Clydesdale and Normans for heavy work, and the Hambletonians for saddle and light harness. Short Horns, Jerseys and Holsteins are the principal breeds of cattle raised. While the Short Horns predominate in numbers, there are some very fine herds of both of the latter breeds. Of sheep, the fine-wool breeds are generally raised, there being but very few of the long-wool or mutton breeds in the county. Poland-China, Berkshire and Chester White are the only breeds of swine raised to any extent. All of these breeds have their admirers, and it is hard to tell which breed meets with the most favor. Considerable attention is also given to the raising of poultry.

This being one of the counties first settled, most of the land is cleared and in a high state of cultivation. The few forests that still remain are well timbered, mostly oak of a superior quality. The surface of this county is undulating, but not rough or rugged to such an extent as to seriously interfere with the tillage of the soil. The soil generally is of a limestone nature and very fertile. Coal and limestone are found in almost inexhaustible quantities.

The annual fair was in every way a success. The exhibit of live stock was very fine, as were also the exhibits in the agricultural and floral halls.

The weather was very chilly and unfavorable during the whole time, yet the receipts were sufficient to pay all expenses and premiums in full. There were only three entries of crops; one of wheat, and two of oats. The following are the reports as furnished by exhibitors:

Crop of wheat: Alex. Henderson, 1st, yield $19\frac{1}{2}$ bushels per acre; ploughed in July, and partially top dressed with barn-yard manure; sowed

15th of September; drilled $1\frac{1}{4}$ bushels of seed per acre; variety, Fulz; harvested June 29, 1889; measured by J. O. Naylor and J. P. Henderson.

Crop of oats: A. M. Rickey, 1st, yield 58 bushels per acre; plowed as early as ground would permit; was rolled, then followed with a broadcast seeder and harrow combined, Lawrance & Chapine's patent, not crossed. The quantity of seed sown was from 2 to 3 bushels per acre. The best yield was where from 2 to $2\frac{1}{2}$ bushels per acre was sowed; the lightest where 3 bushels was sown. Measured by T. Wolf and J. J. Mehollm.

James Francis, 2d, yield $53\frac{1}{2}$ bushels per acre. Two crops of corn were taken off, after which the crop of oats grew on the land. The ground was plowed deep, sowed broadcast, harrowed well, rolled good, two loads of manure used; only 14 bushels of seed used on the 5 acres. Measured by Wm. H. Foster and Clarence Bucey.

The society, ever since its organization, has paid the premiums offered in full, is now in a flourishing condition, and constantly growing in favor with the people of the county.

KNOX COUNTY.

The thirty-third annual fair of the Knox County Agricultural Society was held on the society grounds, August 28 to 31, 1888, being one month earlier than usual, in order not to conflict with the great Ohio Centennial Exhibition at Columbus.

The exhibition was a complete success in every department.

The attendance was not as large as could have been desired, owing to the Centennial exhibition to be held so close by, and the unfavorable weather prevailing at the time. Yet the steady improvement in agriculture and the improvement of the live stock of the county was very apparent. The county stands at the front in the introduction of the best improved breeds of domestic animals of all kinds, and especially of horses. The farmers have not only decided that the scrub stock must go, but have learned that better care and attention is necessary to succeed in stock-raising, which is their principal source of revenue.

The condition of the farmer depends largely on their good or bad management. The farmers have burdens to bear by being taxed by Government (a high protective tariff, or rather the tariff levied during the war of the rebellion as a military necessity), and by their State, county and townships, and the direct tax that the merchants place on their goods in the way of costs. This all comes out of the farmers.

Is there any occupation in life that can stand the strain and pressure that farming does? With us we may recall the old saying, "The king rules all; the priest prays for all; the farmer pays for all."

Were the business of farming managed as closely in all of its details as those of the successful merchant, mechanic or banker, there would be less depression in the business. The least friction of taxation the merchant or banker will resist, but when it comes to the farmer, it is heaped upon him without a word of complaint or protestation.

Almost any farm properly managed will make a comfortable living for the farmer, but the details are too much neglected, and that is where a great amount of depression to the farmer comes from.

The farms of Knox county are small in comparison with some other sections of the country, and are farmed by the owners, with very little exception.

A mixed husbandry prevails. The tiling and clovering of our lands is growing in favor with the farmers. Our county is yearly increasing in material wealth. Splendid houses and barns are being built, and lands much improved and beautified.

Good school houses and churches are found in every neighborhood.

The crops of 1888 were above the average, except wheat, which was fair in most parts of the county. The principal crops grown in the county are wheat, oats, corn, hay, potatoes, clover and fruit. Vegetables and small fruits are produced in greater abundance than formerly.

The farmers, as a rule, feed the products of their farms to live stock, and thus keep up and increase the fertility of their farms.

The western half of the county is composed of drift soil, and uses but little commercial fertilizers. The eastern half is rolling, and composed of a good clay soil, the whole well watered with never failing springs and streams.

LAKE COUNTY.

Lake County Agricultural Society held its thirty-sixth annual fair October 2, 3, 4 and 5. First day was devoted to making entries, and second and third days were devoted to the exhibition of stock and awarding premiums in all departments.

Show of stock was fully as good as any previous year, and the show of vegetables exceeded that of any former year. Show of fruit was exceedingly good. Lake county carried off one second premium on fruit at the Centennial at Columbus.

The fourth and last day of the fair was devoted to the races, but not

largely attended, on account of its raining continuously all day—and, by the way, it rained every day but one during the fair, and on that day the attendance was greater than ever before in any one day.

It being a favorable season for crops, the condition of agriculture for the past year has been good, and perhaps better than for a number of years.

The interest in agriculture and all products of the farm is steadily increasing.

Our farmers' institute, which is to be held on January 22, 23 and 24, promises to be more interesting than any ever held here before.

LAWRENCE COUNTY.

The crops of this, Lawrence county, were about as follows: Wheat, 20 per cent.; corn, 130 per cent.; fruit, 60 per cent.; potatoes, 75 per cent.; vegetables, 150 per cent., etc.

The surface of the county is about one-fourth level and three-fourths hilly. The soil is of various kinds, but principally red clay and a dark sandy loam. The timber comprises all varieties of this latitude.

Improvements are constantly being made in the farm buildings and county roads. Within the county we have three farmers' clubs and one grange.

Fertilizers, rotation of crops, tree planting and grassing of land are being resorted to with good results. Local markets are good, but not equal to those of former years.

LICKING COUNTY.

The society held its annual fair October 2, 3, 4, 5 and 6.

Entries of live stock were large; all the stables and sheds were filled. In all other departments the entries were exceedingly large; the halls of the different departments being filled to their utmost capacity. The weather was anything but fair. It rained every twenty-four hours during the fair and all the last day; consequently our attendance was light.

The shows in horses, cattle and sheep were very good; nearly all classes being well filled with excellent stock. The shows in swine and poultry were exceedingly large and fine. During the fair our exhibitors made sale of a considerable amount of stock. Fruit was perfect in generality and display; probably the largest display ever made in the county.

Vegetables and grain better than the average, and all the space allotted them was well filled. Professional exhibitors from abroad found every

department represented by home production in such quality and quantity as they were not accustomed to encounter in their rounds.

Stock and agriculture are of leading interest in our county. The farmers are wide awake and energetic. In fine-wooled sheep they placed the county at the head of the list and still maintain its reputation.

Short Horn cattle bid fair to surpass all others.

The wheat crop was not up to the average, either in quantity or quality. Corn crop the largest for several years, and cribbed in very good shape, considering the premature frost and the excessive rainfall during October. Potatoes, a large crop; quality not the best, owing to the dry weather in June and July, followed by heavy rains. Oats, good. Hay, an average crop, and demands good prices, notwithstanding the fine fall pastures and the open winter we have had so far. Hay is in good demand at our county seat, from eleven to thirteen dollars per ton.

Respectfully submitted.

J. T. HARTSHORN, *Sec'y.*

LOGAN COUNTY.

This is an agricultural county, although we have quite a number of manufacturing establishments. The year eighteen hundred and eighty-eight, so far as this county is concerned, has been a good average year. Wheat, it is true, was not quite up to the average, but oats and especially corn were considerably above an average, while potatoes and fruits of all kinds were good.

The soil of the county, being mostly limestone, is hard to impoverish, and when it is exhausted it is easily to reclaim. Our farmers, by a rotation of crops, the use of clover, barn-yard manure and fertilizers, keep up the fertility of the soil, so that it produces remunerative crops.

To write of the county fair this year, is to speak of a grand exposition of skill, wealth, beauty and combined excellence of the products of our people. There is no question but the exhibition this year was the grandest ever given by the society in the quality and number of articles. The year was an abundant one, and though the weather was not the most pleasant, yet our farmers made the grandest show ever held on the grounds.

There had been so many excursions, centennials, etc., throughout the State, that it was feared that there would not be as large an exhibit or attendance as usual, but in this we were agreeably disappointed. The first days of the fair were disagreeable and chilly and calculated to discourage the attendance, yet the gate receipts showed up near to former years, while the entries for exhibition were far in excess. It was supposed that

high tide was reached in 1887 when the number of entries was 2,648, yet this year the book closed with 3,661, an increase of 1,013, and we think Logan county can feel justly proud of such an increase in this year of centennials.

LORAIN COUNTY.

The natural conditions and topography of Lorain county are too well known to be given in the annual report of the Lorain County Agricultural Society from year to year.

The spirit of progress manifested in the farming and manufacturing community of this county is constantly increasing. Farms and factories are being fitted up with the most modern improvements; dwellings of taste and convenience are being erected throughout the county, also commodious barns, sheds, tool houses and fences of modern inventions.

This society is in a very prosperous and flourishing condition. The indebtedness is about six hundred dollars; the permanent improvements on the grounds in the past five years amount to about four thousand dollars.

The forty-third annual fair was held September 4, 5, 6 and 7. The weather was favorable the 2d and 3d days, but very unfavorable the 1st and 4th, as there was a constant drizzle, with the appearance of heavy rain. The receipts on Thursday were the largest in the history of the society. However, taking into consideration the inclement weather, the Centennial Exhibitions at Columbus and Cincinnati, etc., we were gratified to know that our fair had been a success in every respect; every department, with the exception of cattle, sheep and swine, was filled to its utmost capacity. The farmers and breeders of Lorain county are making great improvements in breeding fine stock. Our exhibitors of machinery take pride in making their exhibition one of the grand features of the fair.

Fine art hall was well filled with fancy needlework, embroidery, paintings and everything that ornaments and beautifies our homes, showing that our county has its proportion of artistic talent. The floral display was very fine; and best of all, the displays in this hall were almost entirely the handiwork of the citizens of this county. Farm product hall was well filled with the very best, raised in this county.

Mechanics' hall—H. M. Andress, new hall, and the old display sheds, were completely smothered with as nice a display of carriages, cutters, carts, wagons and like articles, as ever was seen at any county fair.

The membership is 275. Number of entries, exclusive of non-enumerated, 1,631.

A. H. MOOERS, *President*.

LUCAS COUNTY.

The principal crops raised in this county are wheat, corn, oats, hay and potatoes. The fact that a large city is located in this county has also stimulated the production of fruit and garden products, as well as milk, butter and eggs.

Wheat has averaged fairly. Corn, an unusual large crop. Oats, a good crop. Hay, a moderate crop. The yield of potatoes was large and the quality was good; in fact, in all the departments of husbandry, the year 1888 was a good one.

As to fruit, a good crop of apples of fair quality was produced. The raising of peaches in this county is now mostly confined to the land adjoining the Maumee Bay. In this locality there was a fine crop, which realized to those who were fortunate enough to have peach orchards, a good return for their investment.

There was also a fine crop of pears in the vicinity of the bay shore. Cherries were nearly, or quite, a failure. A large crop of berries was produced.

The season was good for garden products, and these are constantly increasing; in fact, we say that the portion of our county contiguous to Toledo is fast becoming a large garden.

Ordinarily a large quantity of grapes are raised in this county, but this year the crop was a partial failure.

Another interest which is constantly growing in this county, is the production of milk and butter for the supply of the people of Toledo. It takes a great deal of milk to supply a city of one hundred thousand inhabitants, and this industry is also constantly growing.

The cabbage crop has also been large for several years past, large quantities of cabbage being raised for shipment.

We may safely say that in all the departments of agriculture Lucas county is advancing. Farmers are underdraining their lands and getting better stock. Gardeners are multiplying their products and bettering their quality.

Much attention is also paid to the raising of fruit. The quality of our soil, and its vicinity to a large body of water, appears to give the necessary conditions for raising the best qualities of fruit.

Since our last report, several stone roads leading from the city of Toledo into the county have been made.

Several glass factories have also been started in this county, which has made a demand for the glass-sand which is found in large quantities in Monclova, Springfield, Sylvania and Waterville townships.

We wish again to speak of the good result of the Lucas County Horticultural Society, which has been a live society in our county for many years. Monthly meetings are held, at which the farmers and gardeners, their wives, sons and daughters, not only discuss a good dinner, but compare the results of their own efforts and their observations of what others do, as well.

Essays on topics connected with the farm, garden and household are read by some one previously appointed, and the views of those present are added.

These meetings, aided by the annual display of the Tri-State Fair Association, are affording the best kind of practical education to our farmers—introducing to them the best processes, the most improved machinery, opportunity for comparison as to the most desirable kind of stock, etc., etc.

The Lucas County Agricultural Society has leased its fair grounds and buildings to the Tri-State Fair Association for a term of years, at a nominal rent. The Tri-State Fair Association has charge of said grounds and hold the annual fairs, but the county society selects the committees to review, and awards premiums on agricultural and garden products; in short, it is found that the joint efforts of the two organizations result in maintaining a better and more profitable fair than could be done by the county organization alone.

The report here made is, in consequence, a joint one; the county society reporting as to the general condition of agriculture, and the Tri-State Fair Association the result of the fair.

FINANCIAL REPORT OF THE LUCAS COUNTY AGRICULTURAL SOCIETY FOR THE YEAR
ENDING DECEMBER 31, 1888.

Receipts.

December 31, 1887, balance on hand.....	\$802 68
February 4, 1888, received from county treasury.....	400 00
Total.....	<hr/> \$1,202 68

Expenditures.

January 5, 1888, paid for postals and printing.....	\$1 00
January, 1888, paid expenses of S. S. Ketcham, attending State Agricultural Society.....	12 00
February 7, 1888, paid Irving & Russell for insurance.....	54 00
February 7, 1888, paid to Tri-State Fair Association.....	300 00
December 31, 1888, balance on hand.....	835 68
Total	\$1,202 68

E. W. LINDERSON,
Secretary.

MAHONING COUNTY.

The Board of Managers of the Mahoning County Agricultural Society has made every effort to make the fair of the year 1888 the most successful one in the history of the society, and as one of the means to attain that end, they early in the spring had purchased a tract of land adjoining the old grounds, and had constructed thereon a full half-mile track instead of the old track, for so many years the bugbear of trotting horsemen by reason of the sharp turns thereon, and when the week of the fair opened, they were in that happy state, where they could with truth say that everything that could be done had been done that would have a tendency to carry out their expressed intention; but alas! Man proposes, but God disposes; and before Monday afternoon had passed, there burst upon the managers, happy with anticipation, the hardest rain-storm of the season, converting their new track into a river of water and the grounds into a quagmire. This rain continued at intervals all through the fair, and while the efforts of the officers had been rewarded in having a very much larger exhibit on the grounds than ever before, yet the attendance was not as satisfactory as was desired, and as a necessary consequence, there was a deficit when settlement day came around. However, every one with a claim against the society was paid in full, and the managers started out with renewed vigor to make the fair of 1889 such a success as would put the balance sheet in a better condition.

The season was not a propitious one for many of our principal crops. The extremely dry summer of 1887 had burned many meadows and hay was a partial failure. As a necessary consequence, a great deal of millet has been sown in Mahoning county, and is being fed this winter with much satisfaction to those using it.

Oats bid fair to be a wonderfully productive crop this year, but the extremely wet season caused many fields to become lodged to such an

extent as to depreciate the yield of the crop fully one-half. Corn grew finely, but at this time is not nearly all in the crib, on account of the absolute impossibility of getting into the fields to husk it, and many complaints of its spoiling in the shock are heard on all sides. Wheat has been a fair crop.

The first Farmers' Institute in the history of the county was held last winter at Canfield, under the auspices of the agricultural society, and was enjoyed by all that attended. The managers of the society had much to learn about the proper method of conducting institutes, but quickly fell into line, and promise that the institute to be held in February, 1889, shall show the State Board that their efforts are fully appreciated by the farmers of Mahoning county.

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MARION COUNTY.

Marion county has 425 square miles of land; is located near the central part of the State, has five small rivers, two of which find their way into Lake Erie, and three the Gulf of Mexico. It has fifteen townships, twelve villages and the city of Marion. Five railroads pass through it, and three others in contemplation; the Erie system connecting New York and the mighty West; the Bee Line joining New England with the South-West, and the "Golden Gate"; the Ohio Central and the Chicago and Atlantic running from the Southeast to the great Northwest, and the C., H. V. & T. connecting the great Lakes with the Gulf.

No soil surpasses it in fertility and productiveness. In the north part of the county the land is black prairie, slightly rolling; in the south more rolling, but rich and productive. It is a great agricultural county, and has churches and school houses on almost every cross-road. Manufacturing is carried on at Marion and other points.

Marion county is noted for its fine horses, cattle and sheep.

We have an annual exhibition on our magnificent fair grounds, which, in some respects, is ahead of the State fair, both in exhibits and attendance.

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MEDINA COUNTY.

In making a report of the condition of agriculture from year to year, there can be but little said that is new or of general interest to the community; what was true last year is comparatively true this year.

We are almost strictly an agricultural county, with a few manufacturing industries, and those of limited extent. Our work varies not so much in kind as in amount and quality.

We are a thinking, intelligent people, a fact which overcomes some of the difficulties of the past, and gives aid and hope for future success; this also makes us a progressive people, as we are. It is not now so much considered who sows the most, as who secures the best returns from a given amount sown, for every one will at once concede that it is better, far better, to raise 500 bushels of corn from five acres than to cultivate ten; and this we are able to do by comparing ideas, forming farmers' clubs, holding institutes, and there discussing the various ways that farmers are using to accomplish the desired end. One will give his experience on drainage, how it can be best done and the benefits to be derived. Another on fertilizers, and then on plowing, when to plow and how, and so on until the various systems of farming are thoroughly ventilated. In so doing, the most ignorant can see what he ought to do and how to do it. I have sometimes thought that the man that did not make arrangements to be born in Ohio and in Medina county was very unfortunate.

But more, perhaps, under another head.

The past season has been a productive one, as well as very wet, but the rains have been seasonable; no floods and no droughts.

The meadows never gave better returns, and they are our main dependence. The grass crop was simply immense. Spring crops were put into the ground in good season, and, when the harvest came, farmers were generally satisfied with the yield. Oats gave from 40 to 80 bushels per acre; corn from 75 to 100, 150 and even 180½ over previous crops. Wheat, good and fair price; potatoes, good; most crops have been rather low, but high enough to make farming profitable. I noticed one man reported 10 acres of corn at 1,700 bushels ears. Pretty good, and not so much the quality of the land as the extra system of farming, for our soil is mostly a heavy clay that won't be trifled with, but has to be humored like a nervous trotter.

Our forty-third annual fair was held on the 4th, 5th and 6th of September, 1888. The weather was all that could be desired. The entries larger than ever before, and the show in the several departments was excellent, and a good crowd anxious to see all that was to be seen.

Our county is breeding better stock than ever before. We have a greater variety of horses; some very fine draft and coach horses, and some very promising trotters.

Our list of cattle comprises some fine Durhams, Polled Angus, Holsteins, Jerseys and other special breeds; of sheep and hogs we have a good

selection ; it is said the best car load of sheep ever shipped to New York was from this county.

Our manufacturing interests are generally well represented at our fair. The bee industry of A. I. Root, the hollow-ware foundry of Smart & Webber, the agricultural works of J. W. Dunham & Son, the plows, etc., of M. Old & Son, receive their share of attention and patronage, and we have also the Garfield Injector Co., doing a good business.

The south part of our county is to some extent underlaid with coal, the mining of which gives good returns and furnishes labor for a great many hands. Schools are good. Churches plenty, and altogether we are a contented and happy people.

MERCER COUNTY.

Agriculture is in a prosperous state in Mercer county. The year 1888 has been bountiful to the farmer. Corn was a remarkable crop ; clover and timothy fairly good. Stock-raising is receiving more encouragement. More care and intelligence are manifested in mating.

The exhibition at our county fair of horses was very creditable, especially in pure-bred draft and roadster classes. Perhaps less enthusiasm exists in favor of improvement of cattle than in the breeding of horses.

Corn and grass seem best adapted to our soil. These crops yield abundantly. Less interest is taken in the fruits.

Much interest is taken in breeding swine, especially Poland-Chinas.

The roads of the county are being rapidly improved by grading, draining and graveling. Our farms are being well underdrained.

The supplies of natural gas released in the Mercer gas fields are simply marvelous. Celina, the county seat, is supplied with light and fuel from the field in the county. It is rapidly improving in consequence.

H. B. BENNET,
President.

S. A. ARMSTRONG,
Secretary.

MIAMI COUNTY.

The Miami County Agricultural Society held its forty-third annual fair October 1, 2, 3, 4 and 5, 1888, and although the entries, premiums offered and premiums awarded were in excess of any fair ever before held in the county, the receipts were sufficient to pay the premiums in full,

after expending about twelve hundred dollars for permanent improvements, and also to leave a nice balance in the treasury.

The exhibits of the different breeds of horses, cattle, sheep and hogs were unusually fine, and the society was compelled to erect extensive additions to stables and pens to accommodate the increased number of entries in this department, showing that our county is keeping pace with neighboring counties in procuring and raising the best of its kind.

The display in cereals, vegetables and fruits was a practical demonstration that our soil is well adapted to mixed farming.

We have quite a number of importers and breeders of pure-bred stock in our county, and we are glad to know they are receiving a liberal and well deserved patronage.

The large attendance at our fairs and farmers' institutes, together with the fact that nearly every farmer is taking one or more agricultural papers, shows plainly that he is interested in his calling, and realizes that to make it profitable, all the facts developed by scientific investigation, as well as the experiences of his neighbors, will be great helpers.

The wheat yield was probably not more than fifty per cent. of a full crop, and the quality inferior; the average weight not being more than fifty-five pounds per bushel. Among the causes to bring about this result, were, 1st, the very dry season during the time of preparing the ground and sowing the seed, causing a very short growth in the fall. 2d: Hard freezing during the winter- with no snow to protect the plant. 3d: A snow in March, which in many places about finished the job. The corn crop was about the average yield, but much of it damaged by early frost. Oats, above the average yield and of good quality. Clover seed an average yield. Hay, a good crop and of splendid quality. In consequence of dressed beef from Chicago and St. Louis being shipped into our markets, the prices of fat cattle have so declined that but few farmers will undertake to feed for the spring market, and this is unfortunate for us in more ways than one, as it not only destroys a business which has heretofore been profitable, but the manure pile at the barn will necessarily become less, and poorer lands and poorer crops will be the inevitable results, and we do hope our law-makers will look after this matter, and, if possible, enact such laws as will protect the farmers from the evil effects of these extensive combines, trusts and monopolies.

Miami county has but a very small per cent. of waste land within her borders, and most of her farms are well underdrained.

As yet but little commercial fertilizers are used, the farmers depending mostly upon barn-yard manure and clover, with a proper rotation of crops and a thorough preparation of the soil by tillage.

Gravel is plenty, and under the Road Improvement Law passed in 1876, we now have about six hundred miles of free pikes.

Respectfully,

W. I. TENNEY, *Sec'y.*

MONROE COUNTY.

The Monroe County Agricultural Society held its thirty-seventh annual fair at Woodfield, on the 11th, 12th and 13th days of September, 1888. The attendance was not up to the usual standard for several reasons, among which was the Columbus Centennial, and especially G. A. R. week, which hit us exactly; also a heavy shower of rain the second afternoon of the fair. The season was favorable for most crops, except, perhaps, potatoes, which fell below the average yield. Hay was also a light crop, owing to a severe drouth the year before, which killed the grass even to the roots. The fruit crop was simply immense, and bushels of apples went to waste. The corn crop was very good, and an average yield or perhaps greater. There was much wet weather after it was cut and shocked, which did some damage to it by causing it to mould and rot. In regard to stock, the sheep have the lead and of the best quality. In the cattle line we have some Holsteins, Short Horns and Jerseys. Of swine we have Chester White, Poland-China and Berkshire. Poultry is receiving some attention also, for we have a number of persons engaged in the raising of the fine breed now so much in vogue. In fact, they have the hen-fever bad. We have abundance of timber of all kinds for home consumption. Taken altogether our county, with its diversified interests, is doing about as well as any other county in the State, with the facilities she has. One thing we lack is coal. We have to depend on the B., Z. & C. Railroad for it, and the present arrangements are not very satisfactory. Owing to the causes above mentioned, our receipts were far below the average, and we were able to pay only 60 per cent. of the premiums. We still have a bonded debt, of which we are able to pay a part every year, so that in time we hope we will be able to pay off. Interest in the fair is unabated, and we do hope, by a dispensation of Providence in giving us good weather, once more to place ourselves on better ground financially.

I. P. FARQUHAR,
President.

MORGAN COUNTY.

The thirty-sixth annual fair of the Morgan County Agricultural Society was held on its grounds near McConnelsville, October 9, 10, 11 and 12, 1888. The entries were fully up in amount and character to the average of former years. The weather unfortunately was very inclement, and for this reason the financial results were not so successful as the friends of the society had expected.

The stock exhibit was fair, perhaps fully up to the average.

The poultry exhibit was the largest and best arranged ever shown on the grounds. All the standard breeds were shown, and the newer ones just coming into public notice were fully represented.

In agricultural and farm implements the display was unusually good, while in domestic and ornamental work, fine arts and all the displays incident to floral hall, the success was unqualified and far exceeded that of any previous year.

Ours is chiefly an agricultural county. We are glad to report that more attention is being paid from year to year to methods of farming and fertilizing the lands used for crops.

Wheat did not make more than half a crop; quality fair. Corn, the largest and best crop in the history of the county.

Potatoes yielded a large crop; the quality was, however, only fair.

Fruit of all kinds was abundant. Eighteen hundred and eighty-eight will long be remembered as the year of abundance in this county, so far as fruit is concerned. The quality of the fruit, too, was exceptionally fine.

The soil of this county is largely limestone formation, and most of our lands are therefore more productive than the average lands of the State. Especially are they adapted to fruit culture, and it is rapidly coming to the front as one of the most important sources of revenue to our farmers.

JOHN A. FLOYD, *Pres't.*

MORROW COUNTY.

The thirty-eighth annual fair was held at Mt. Giliad on the 2d, 3d, 4th and 5th of October, 1888. The show of stock was excellent, perhaps not quite so numerous as some other years, but in quality was never better. Much pride is manifested in the fine stock in this county. Quite a number of the breeders of fine stock were successful exhibitors at the Ohio Centennial. Farming is not neglected—much improvement in this line is manifested. A great deal of tiling is being done, and it will not be many

years until the waste and barren places in Morrow will be under cultivation. While we do not boast in Morrow of excellency in all things, yet we do feel that for grass, oats and potatoes, we have a fine soil.

This year, we can cheerfully say, has been a good year. Corn a good crop as to quantity, while a little difficult in quality. Wheat nearly a failure. Oats splendid—a large amount raised, quality good. Potatoes were never better. Fruit of all kinds in rich abundance. Stock in good condition—no prevailing disease. Much interest is taken in farmers' institutes.

One great drawback to us is our roads. No gravel roads, and often when we could market our grain at fair prices, roads are bad. We hope the day is not far distant when we will have good roads. Then we think that Morrow will rank with other counties in the State.

MUSKINGUM COUNTY.

The Muskingum County Agricultural Society held its forty-second annual fair on Tuesday, Wednesday, Thursday and Friday, August 28, 29, 30 and 31, 1888. Although the Board of Directors was on the grounds the entire four days, with a brass band and many other first-class attractions, owing to the State centennial, other county fairs, bad weather and numerous other greater attractions and drawbacks, our fair was not a financial success. Of the four days, only one, Thursday, showed up with any hope of success. On Thursday fully six or seven thousand persons were on the grounds, and went away well pleased with our exhibit, and with the purpose of returning on Friday. But we had our usual Friday luck. The day was ushered in with rain, and from early morn till the middle of the afternoon, rain, constant and incessant, was in order, and nothing else, and we did not open our ticket office or post our gate-keepers. It has become a common saying that "the Muskingum county fair brings the equinoxial storm, no matter what time in the year it is held," and, although very early in the season, yet the saying was clearly verified in appearance. Entries in live stock were fully up to other, and our best, years, but fell off largely in fruits, grains, and in agricultural implements, except as to apples, of which we had a large display. Perhaps we never had a better showing of horses and cattle, of which our county is equal to any in the State, in proof of which our horse and cattle men carry away a goodly number of first premiums at our State fair each year. Owing to the bad weather, and our track being in a very bad condition, our principal attraction, to-wit, the speed ring, entries were few. Only two of our

racers filled. The last race on our programme, and the one which created the greatest interest, was the free-for-all trot, purse \$300, set for Friday, declared off on account of the weather, greatly to the disappointment of the party present owning the fastest horse. The receipts of our fair were not sufficient to pay all current expenses, consequently our Society enters upon the new year with the balance on the wrong side of the ledger, but with the determination to "fight it out on this line," still hoping that luck may change in our favor. Better means of transportation to and from our grounds are badly needed, and are under contemplation, which, when accomplished, will undoubtedly secure success for our fair. We have the finest grounds and the best half-mile race-track in the State, also an abundant supply of good, fresh and pure water for all purposes, within the grounds. Our buildings, although somewhat out of repair, are attractive and commodious. Our citizen agriculturists were certainly blessed the past year with success, plenty and prosperity, as there was an abundant corn, potato and fruit crop. Hay was certainly above the average, as the price per ton, until late in the fall, was below \$10. The wheat crop was not as good as last year, and yet the highest point in price has been \$1 per bushel. Corn was as low as 35 cents per bushel. Apples were so low that they were a drug on the market at 20 cents per bushel. The peach crop was large, yet prices ruled high, budded fruit averaging \$1.25, or over, while common fruit was sold as low as 35 cents per bushel. The low lands of our county, of which there is a goodly quantity, are well adapted to growing vegetables, especially along the Muskingum river, and gardening is extensively and profitably followed, a market for which is readily found at home, in Zanesville, with a constant demand from our neighboring cities and towns for any surplus. Our stock men are still improving their grades, and on the lookout for, and the introduction of, any better animals; our enterprising farmer, John W. Marshall, having invested in, and had on exhibition at our fair, the Polled Angus breed, the first time it has been shown in our county, and which will eventually prove to be a profitable investment for Mr. Marshall. Portions of our land could be made vastly more valuable if properly drained, and farmers owning such lands are turning their attention to such drainage. Zanesville will soon be able to not only furnish such articles of manufacture in sufficient quantities for home use, but also for shipment, as within the year an extensive drain-tile factory will be established and in running order. We also boast of one of the largest floor-tiling factories in the world, and the production of the best floor-tiling. We have in our county a large society of horticulturists, but as between them and our agriculturists there is harmony of feeling and, generally, unity of interest and action in our annual agricultural and industrial show. Among all

our citizens, composed of all classes, towit: the professor, the mechanic, the farmer, the laborer and the loafer, the farmer stands the peer of any, and as a county, Muskingum does not propose to take a back seat.

NOBLE COUNTY.

The thirty-sixth annual exhibition of the Noble County Agricultural Society was held on their grounds at Sarahsville on the 5th, 6th and 7th of September, 1888.

The weather on the first and second days was not favorable, it being cold, and on the third day a very cold rain all day, which prevented us from having any fair on the last day, which promised to be our best day, and therefore our receipts were much reduced. Financially our fair was not a success, in other respects it was.

The number of enteries was an average of previous years. The falling off in attendance may be attributed to several causes, chiefly the unfavorableness of the weather, the prevailing scarcity of money, and the fact that the fair was held earlier than usual, and the farmers being generally busy with their fall work.

Of crops. The past season being unusually wet, and our bottom lands generally flooded, much damage was done to the growing crops, and much of it was taken in in a damaged condition.

Wheat, which had been damaged by the winter, was far better than expected, the yield being a fair average.

Corn, more than the usual acreage planted, quality moderate, and quantity very large; rye but little grown.

Oats, equal to any crop ever raised in the county, both as to yield and quality.

Hay, average crop, and of good average quality.

We had more than an average acreage of tobacco, the quality and amount of which is above an average crop.

Potatoes, owing to the very wet season, did not make more than half a crop.

The fruit crop was quite abundant and quality excellent.

JOEL T. DAVIS, *Treasurer.*

OTTAWA COUNTY.

The Ottawa County Fair was held on its grounds near Port Clinton, September 26, 27 and 28. The attendance good, the weather threatening.

All departments except swine and cattle were well represented. Up to within a few years Ottawa county could show as fine herds of Short Horns and Holsteins as any county in the State, but now the territory that grew those splendid animals is covered with vineyards and peach orchards. The central and western part of Ottawa county still continues to raise all kinds of cereals, and finds in the eastern part a good market for a large share of its produce.

The exhibit of horses was a credit to little Ottawa. There could be seen some splendid imported Percheron horses and mares, also a few Clydes, though the Percheron seems to be most in demand. Our farmers for the last twenty years have been taking great interest in the breeding of horses, using only first-class animals, until now it would be to the interest of buyers of large animals to come and see us.

One glance at the Floral Hall would convince any one that the ladies had not lost their interest in the fair, for there could be seen from the finest needle work to the costliest garment. The exhibit in Fruit Hall could not be excelled by any county in Ohio. The Centennial Fruit Committee was on hand, and at the close of the fair shipped the most of it to Columbus. It has been demonstrated by fifteen or twenty years' actual experience that the eastern end of Ottawa, or, as it is more commonly called, the Island and Peninsula, possesses all the advantages of water, climate and soil necessary to the cultivation of fruit.

There was in the year 1888 a large crop of all kinds of fruit, except the later varieties of grapes. Potatoes good; wheat about half a crop, quality poor; corn good. Owing to the large crop of corn more pork from the same number of hogs was made than last year. Swine in this county have been free from disease. Our farmers are beginning to see the advantage of tile drainage. There are now seven or eight tile factories in this county, all doing a good business. The line is graded through this county, which will give us a southern outlet for our produce, which will be of great advantage to fruit-growers and fish dealers.

PAULDING COUNTY.

The seventeenth annual fair was held on the fair grounds at Paulding, Ohio, September 11, 12, 13 and 14, 1888. A great interest was manifested in the fair the past season; the Board made a purchase of about ten more acres of land; made many improvements, put new fence entirely around the whole grounds, made new horse-stalls, and new buildings.

The attendance was very good during the whole time. In all the

departments the display was most excellent. Corn, wheat and vegetables were never better.

The county is improving very fast; all the improved farms are ditched with tile; good, substantial buildings are being erected in place of the old, log buildings. The Directors displayed judgment in the purchase of additional ground at the present time, but in order to do so they had to assume a small debt, which will embarrass the society for a time, unless some way is found to obtain relief.

PERRY COUNTY.

The twentieth annual fair of the Perry County Agricultural Society was held on the society's ground, at New Lexington, September 26, 27 and 28, 1888, and while the exhibits in quantity and quality excelled all our former fairs, the cash receipts were not enough to pay all expenses and premiums in full, on account of continued rain keeping the farmers' seeding and fall work back, while the many Centennials being more interesting to many than county fairs, also interfered.

Most assuredly our county is making commendable progress in all the word "progress" implies. The more intelligent and scientific practical methods are not ignored by our industrious class of farmers. The general use of commercial fertilizers has largely increased the productiveness of our farms, and their use has been brought about largely through the agency of our county fairs.

We have railroads in every township. Immense deposits of coal, iron-ore, fire-clay, potter's clay, etc., giving employment to many hundreds that are consumers, making a good home market for the farmers' products. Our timber is fast disappearing. It takes a vast amount of timber to tie our railroads.

Our crops this year have been a fair average. Fruit of all kinds abundant. The exhibition of horses, cattle, sheep, swine and poultry shows conclusively that our stock men are fully up with the times on propagating valuable stock.

PICKAWAY COUNTY.

CIRCLEVILLE, OHIO, *January 15, 1889.*

The second annual fair of the Pickaway County Agricultural Society was held on the fair grounds in this city on October 2, 3, 4 and 5, 1888.

Financially speaking, the fair was not a success, there being a

deficiency of about \$1,800, owing, we think, to the fact that the Columbus and Cincinnati Centennials were both held during the same time, and for sometime previous, and that a large number of our citizens had attended either one or the other, or perhaps both, of said centennials, and had become so well satisfied with what they had seen that they failed to attend our fair, our attendance was very light. The exhibition in the horse department was very good, and in the fruit department was excellent—could not have been better.

The wheat crop of our county for the last year was poor, not more than one-third of a crop, compared with other years, and owing to the wet fall there has not been near an average crop of wheat sown. Our corn crop for the last year was excellent, perhaps the largest ever raised in the county; and fruit was more abundant than ever before known, there being more than could be used here, large quantities were shipped to eastern and western markets.

Yours, etc.,

M. W. MORRIS, *Secretary*.

PORTAGE COUNTY.

The fall of 1888 will long be remembered as one disastrous to agricultural fairs, owing to wet and disagreeable weather, and the people of Portage county, who feel interested in their fair, congratulate themselves on its financial success, although the weather was the coldest and most disagreeable that they have experienced for years. The exhibit of stock was not as large as in 1887, but was of a good quality, showing that the breeders in this county are among the best.

The poultry exhibit was less than preceding years, owing somewhat to the removal of one of the largest exhibitors to another State.

The display of fruit was less than formerly, owing to a poor fruit season, with the exception of peaches and grapes.

In vegetables the display was never better, the required space occupying fully one-half of the new hall. Other exhibits were about the same as formerly, and altogether the show at this fair was as good as its predecessors.

Farming in Portage for 1888 has been attended with its usual successes and failures. The season will be known as a wet and cold one. The crop of corn was unusually good. Large quantities of peaches and potatoes were exported.

Many improvements have been made, especially in the county seat and metropolis; the leading ones being the magnificent Riddle block and electric lights in Ravenna, and the Carver block and others in Kent.

PREBLE COUNTY. .

Preble County Agricultural Society held its annual fair September 24, 25, 26, 27 and 28, 1888, at Eaton, Ohio. The attendance was all the society could wish under the circumstances, it being centennial and presidential campaign year in Ohio. The entries this year were greater than any previous year. Horse-stalls were all taken up before third day of fair. The exhibits in all the departments were as good as other years, and in some departments better, except in the hog department, hog-cholera having made its appearance in the county just before our fair, preventing many from attending with stock. With this exception, we had the second best county fair in the State, all things considered, and will say that our county is in a healthy agricultural condition. Our corn-crop was one of the largest crops raised in the county for many years. All other crops was a good average yield. All in all, our fair of 1888 has been a grand success.

PUTNAM COUNTY.

This county being purely agricultural, and but little manufacturing, it is but natural that the improvements should be, and are, very great. Much fine stock is being imported into the county, consisting of horses, cattle, hogs and sheep. Cereal and fruit crops were good, on the whole. Wheat was a fair crop. Corn never better. Oats above an average. Small fruits were good, and the apple crop was excellent.

The fair held here was the best ever held in the county. The board of directors, by active effort, and by securing the hearty co-operation of the citizens of the county, have built up a feeling of pride and excellence, and a desire to excel among themselves, which has so extended itself that there is a positive insurance for the better improvement and exhibit of the fair for each succeeding year. This year's entries were by one-half larger than ever before, and the want of space and stalls, together with the condition of the weather, were the only things the board had to contend with.

RICHLAND COUNTY.

Richland county is situated rather in the northern part of the State, being but two counties from the lake, and rather central as regards east and west. The eastern and southern parts are both undulating and hilly, the northern part and western more level. The most of its land is adapted to either the growing of grain or stock. It is well watered with

numerous creeks and springs, and is heavily timbered, with most of the different kinds that are calculated for manufacturing or building purposes. The principal occupation of the farmers is growing grain, although some are giving their attention to the breeding of fine horses, such as the Norman, Shire, Clydesdale, Hambletonian, and roadsters of different breeds. The improvement in better breeds of cattle, hogs, sheep and horses, has been very marked within the last few years. Wheat, oats, corn and barley are the principal crops; a large part of our wheat is grown on oats stubble, plowed as soon as the crop is harvested. It generally receives all the manure that is left after the spring crop is put out, either by being plowed under or top dressed. The latter appears to give the best results, although the clover sod plowed in the months of June or July, with occasional harrowings until the time of sowing, with light top dressings of manure, drilled in with commercial fertilizers, is almost certain to give a good crop. The Hessian fly appears to be the most destructive insect we have to contend with. In some seasons it almost totally destroys all the early sown wheat.

Our corn is mostly grown on sod. Its destructive insects are the cut worm, and white grub worm.

The oat crop is one of our surest crops, generally sown on corn stubble; it is sometimes injured by rust. The most destructive insect is the grasshopper, which sometimes greatly injures the crop, when it is about ready for harvest.

Barley for a few years past has been much neglected, but farmers at present are giving it considerable attention. It gives the best results sown on corn stubble, which has been well manured, or drilled in with commercial fertilizers. It is almost a sure crop, and is only affected by severe drouths.

Our wheat crop this season was considerably below the average, caused by late sowing last fall, and the very unfavorable winter season.

Oats was an average crop, but was difficult to harvest, owing to its being badly blown down about the time it was ready to harvest.

Corn was the largest crop ever grown, but in quality it was not so good. This was caused by the terrible cold, wet weather the time it should have ripened. This kind of weather continued until the crop had to be gathered, consequently we hear many farmers complaining of moulded corn.

The hay crop was very large, and generally harvested in good condition.

The crop of potatoes was also the largest ever grown; and the southern part of our county appears to be well adapted to their growth, large quantities being annually grown.

Apples, peaches, pears, and all kinds of fruit were up to the average in quality, and the different kinds of fruit crops were very large.

The fourteenth annual fair of the Richland County Agricultural Society, was held at Mansfield, August 28, 29, 30 and 31, 1888. This was the most successful fair ever held by the Society. The entries were not so large in some departments, but the quality was much better. The quality of horses, cattle, sheep and poultry, was ahead of any former fair, a good indication of improvement. Fine art hall was filled to overflowing. Owing to the fair being held in August, the fruit exhibit was not so large, but the quality was good. The machinery exhibit was very large. The Board of Managers made arrangements with the Bureau of Emigration of the State of Georgia for an exhibit of the agricultural products of that State. The exhibit was very large, and being well conducted, it added much to the attraction of the fair.

ROSS COUNTY.

The nineteenth annual Ross county fair, for the year 1888, was held upon the grounds of the county agricultural society, at Chillicothe, on the 14th, 15th, 16th and 17th of August. The weather was fair and auspicious, and our fair, on the whole, was yet better than the great fair we had last year, and decidedly the best fair ever held in our county. The display in all departments, especially in the departments of fruit and live stock, was unusually full and good. Our society is making every effort to make ours a truly agricultural fair—a “farmers’ show”—and the large attendance, and great interest shown in, by our farmers, is convincing proof that the labor of our society is being appreciated and rewarded.

The centennial exhibitions held this year at Columbus and Cincinnati diminished the attendance somewhat, but, we think, slightly increased the variety and extent of the exhibits in the various departments. A new, and, to our patrons, very attractive feature of our fair this year, was a centennial department, wherein was a great collection of old relics, old farm and household utensils of every form and name, and in great variety, etc., “of ye olden time.”

Our society made further additions and improvements upon their fair grounds, erecting a large and commodious poultry hall, many new cattle and sheep sheds, etc. Our fair grounds are now in excellent shape; the buildings are large and substantial, and well arranged; there is on the ground plenty of shade and water. We have an excellent one-half mile race-track, and new buildings are erected from time to time as they are required by the increasing number of exhibitors. A noticeable and commendable feature of our fair this year was the very large display of agricultural implements, machinery, etc.,—far in excess of any previous year.

The merits and demerits of different manufacturers' make of the various farming tools could be, and were, studied by our "horny handed sons of toil," as they stood side by side.

Ross county is situated in the southern part of the State, and is watered by the Scioto river, and Prairie, Deer, Salt, North Fork and Walnut creeks. The soil is rich and productive, especially the valleys of the water-courses. This year was one of the most fruitful ever known. The fruit crop was larger than ever, and the oldest inhabitant could not recollect having seen anything equal to it. The season was especially good for growth, and vegetation of any kind, grew almost tropical. The corn crop, both in acreage and yield, was very large, and the corn well ripened and of excellent quality. The wheat crop was fair, but the growing wheat was injured in some parts of our county by the chinch-bug, which appeared in greater numbers and did more damage than ever before. Some means must be devised for checking their ravages. I think, on a low estimate, they did \$1,000 damage in this county this year. The oats crop was fair, and has paid our farmers well who raised it. The potato crop, both in acreage and yield, is much above the average. The clover crop was enormous, but the quantity of seed raised this year was not so great as it was last year. A hitherto new enemy of the clover plant appeared this year and did some damage, and caused much anxiety among our farmers. Clover is one of their most favored crops. But little timothy hay was cut and cured here this year. Ross county has long been known as being one of the first counties of the State in fruit production and growth, but this year she broke the record, and such a fruit crop, of every variety and species, was never seen before.

Peach orchards of any age were almost entirely ruined by being broken to pieces by their loads of fruit, and now look as if a dreadful storm had passed through the orchards. New orchards will have to be planted. One or two trees easily supplied a family. As might have been expected, the price was very low. The apple crop was very large, and the fruit of very fine quality and size. Plums, pears, and all other kinds of fruits, and small fruits and berries of every kind were very abundant and cheap.

Our farmers pay more attention, year by year, to their flocks and herds, and better breeds and strains of blood of the domestic are being introduced. The farmer is daily coming to recognize the fact that stock-breeding, of itself, is a study, and a science, and that to have the balance on the right side of the farmer's ledger, the question no longer is, "how many hogs, or cattle, or sheep, have you?" but, "what breed, or strain of blood are they?"

Ross county has long been noted for her fine horses.

Several farmers' institutes were held in this county last winter (1887-8), and were well attended. Several more will be held this winter (1888-9).

Farmers' clubs, which meet weekly during the winter season, are becoming numerous and common, and they signify that our farmers clearly recognize the benefit to be derived from a study of methods and mutual comparison and discussion of plans, etc., and are endeavoring to be up with the times.

Respectfully submitted.

HENRY W. MORROW,
Secretary Scioto Valley Fair Association.

SANDUSKY COUNTY.

The thirty-sixth annual fair of the Sandusky County Agricultural Society was held on their beautiful grounds in Fremont, October 2, 3, 4 and 5, 1888. We take great pleasure in stating to you that it was a grand success, both financially and otherwise. The first two days were cold and rainy, which greatly diminished the crowd of people on those days, but Thursday was a clear day, and people and teams commenced to stream in early in the morning, continuing until the grounds became a surging mass of human beings. Never before in the history of the society has there been such a large number of persons at our fair. Friday, it rained all day, which greatly diminished the attendance; but, considering all these things, we will be able to pay something on our indebtedness, which is \$3,200. The exhibits exceeded by far those of any previous year. Especially was this so in the horse, machinery, fruit and fine art departments.

We had expert judges in cattle, sheep, swine and poultry, and it has met the approbation of all the exhibitors in those departments. In fact, the exhibitors in the horse department demand an expert next year. I think it has had an elevating influence upon the breeders of this county, for already I have heard of three parties going away to get better stock, saying that they were going to take the premium next year. The exhibitors all demand that the expert judge system be continued, and we are not met with the assertion that the "man took the premium instead of the article." We took great pains in getting good judges.

Our society is in a prosperous condition; a great many improvements have been made upon the grounds this year. The officers of the society have run it on an economical basis, and, if continued, will soon be out of debt. Our farmers are an energetic class of people, well educated, and intelligent, and try to raise the best quality of everything; especially is

this so in regard to horses. We have the finest draft and general purpose horses in the country, but are deficient in fine carriage horses.

SCIOTO COUNTY.

The Ohio Valley Agricultural Society has enjoyed a prosperous organization of nine years, and the second annual fair, held August 7, 8, 9 and 10, 1888, served to demonstrate its great value as an educator of those who are to be our successors in all that pertains to the agricultural profession. Our society is composed of farmers, market gardeners, fruit-growers and merchants, all of whom strive to make our fairs a great success. It is conceded by the intelligent farmers of this section that they have already received actual benefits from the interchange of opinions and the comparisons made by actual exhibitions of stock and farm products at the fairs, and it is the aim and expectation to make our next fair still more creditable than in the past. We have been fortunate in securing the co-operation of the ladies in all that makes our art hall displays so elegant, and we can, in some respects, equal the exhibits at the State Fairs. The general aspects of this report are mainly as heretofore; the farmers have done well the past year; the crops of corn, potatoes, wheat and other grains have been excellent, and the fruit crops of 1888 will be long remembered as the most bountiful in years. In small fruits there is a steady gain from year to year, and the shipments of strawberries, blackberries and raspberries is quite an item to our northern markets. The cultivation of grapes has almost ceased, and this year, past, was even smaller than heretofore. We hope new interest will be given to it. A commendable feature of the small fruit business is the healthy, outdoor employment it affords to members of families who live in poorly ventilated city houses. The homes of Scioto county are improving in comfort and convenience year by year, and outbuildings show wonderful strides, as compared with earlier years.

The valuable oak timber that abounds in this section is being fast drawn upon for use, and it is only a question of time when it will almost have disappeared. It would seem proper to urge the subject of tree-planting, not only by our own farmers, but throughout the State at large. Trusting the next annual report of our society will be filled with noted improvements in all departments, I beg to remain,

Yours,

CHAS. W. ZELL, *Secretary.*

SENECA COUNTY.

Seneca county enjoys natural advantages for agricultural purposes, equal to any county in the State, soil, water, timber and lime stone supply a basis upon which an enterprising and thrifty population have built a grand structure of improvement, both in agriculture and manufactures. No county in Ohio has more tasteful or substantial farm residences and other needful farm buildings, while originally one-half of her territory was too wet for cultivation, a thorough system of drainage has made this portion her best farming land. While adding to her capacity for production it has also banished the old time "chills and fever" and made Seneca one of the healthy counties. The recent discovery and rapid utilization of petroleum and natural gas within the county and upon her borders is giving a wonderful impetus to manufactures. Tiffin and Fostoria, offering free fuel, are attracting and already operating important factories. In these cities the people generally use gas for fuel. Bringing the manufacturer and the farmer so near together must be an advantage to both, and all the benefits of increased demand and better prices. For quantity and quality of flour made at home, Seneca county may well feel proud. If the "National Flour Trust" does not include our mills—with its scheme of putting up the price of flour and lowering the price of wheat—we may continue to "feel proud" of them. The thirty-sixth annual fair of the County Society was held on its grounds September 11, 12, 13, and 14. An excellent exhibit in every department was had. Unfortunately, however, this was also "Grand Army" week at the Ohio Centennial. Several thousand Senecas sought the special attraction at Columbus; others saved their time and "change" to make the round trip to both Centennials, Cincinnati and Columbus. The result here—lighter gate receipts and corresponding shortage of means. By the growth of the city of Tiffin the fair grounds—the joint property of the Society and the county—are, it is thought, become too valuable to hold for fair purposes, and steps are being taken to change locations. When this is accomplished, with a reorganization to avoid mistakes of the past, it is confidently believed that Seneca will take a front place among the agricultural societies of the State.

SHELBY COUNTY.

The Shelby County Fair was held on the 25th, 26th, 27th and 28th of September.

The entries this year were 1,973, against 1,972 last year. The number

of entries would greatly increase if our exposition halls were larger and in better condition.

The experience of many of our exhibitors two years ago, in damage to exhibits by water from bad roofs, has had its effect in diminishing the display in Fine Art and Domestic halls, and until this defect is remedied we need not look for improvement there.

The question of changing the location of the fair grounds for the purpose of acquiring more room, has not been settled, and until it is we cannot erect the buildings necessary.

Owing to the cold, raw atmosphere of Wednesday and Thursday, our receipts at the gate were \$153.00 less than last year.

The display in stock was fully up to that of last year in numbers, but in quality far surpassed any display of former years.

The exhibits in all departments show a general improvement.

The Farmers' Institutes are enlisting an interest in agriculture and stock-raising that will have an influence for the better in our fair exhibits in the near future. We hope to show a decided improvement in our next report.

On the 19th of June we lost our worthy and much esteemed President, Eliphalet Blanchard, by death. This was a sad loss to our county, for he was a model man and a christian gentleman.

We cannot impress those who did not know him of his true worth better than to quote from his obituary in one of our county papers at the time of his death:

"He was always a promoter of agriculture, his exhibits at the fair showing that he was fully alive to improved varieties of grain, vegetables and stock.

"His farm was a model in its appurtenances. His fences and gates never leaned, and weeds found no undisturbed rest in fence-corners and obscure places. His stock was always in fine condition, ready for the markets or for use. His ice house, a luxury and necessity for comfort too rarely found, was well filled, and his garden was rich with a variety of the latest and best small fruits, and his orchard was not neglected.

"He had the largest and best forest of maples in the county, and hundreds of gallons of syrup annually, and thus had a surplus of the luxuries as well as the necessities of life, and got them from his farm.

"He was exceedingly and intelligently industrious, but did not worry, and his home was a model home as well as his farm was a model farm.

"In his sickness he seemed to long for eternal rest. The grand christian man has found it, and if ever one experiences a halcyon calm of soul in the world beyond, it is our old friend Eliphalet Blanchard."

He was born in Butler county, Ohio, in 1821, was raised a Quaker,

came to Shelby county in 1832, where he spent the remainder of his life.

He arrived at conclusions after calm deliberation, and was always found on the right side of all important questions. May his memory live long in our hearts.

G. C. ANDERSON, *Secretary.*

STARK COUNTY.

The husbandman of Stark county has cause for gratitude towards the Giver of all good for the bountiful harvests of 1888, and the general good health that prevailed throughout our county, not alone among mankind, but our four-footed friends as well. While money failed to flow as freely as could be desired, yet there was sufficient to credit the past year as a prosperous one.

With our ever increasing population throughout the county, but especially in our prosperous cities of Canton, Massillon and Alliance, the tendency is toward smaller farms, with better care and tillage, and consequently increased yields.

We feel assured that the census of 1890 will credit our county with an increase of forty per cent. over that of 1880.

Many manufacturing establishments are going up yearly within our borders, on account of our proximity to the coal fields; in fact you hardly need step outside of the corporate limits of Canton now for coal, on the south, east and north, as it is mined at our very doors, and also brought in by three lines of railways, so that good fuel can be had at from 75c. to \$1.75 per ton. Cheap fuel makes populous cities, and they in turn make good home markets, so that many tillers of the soil will find many things profitable to grow besides the ordinary farm crops.

Our wheat crop, while not as large or as fine as we have had, was about the average, and very fine samples were on exhibition at our fair. We learned of large fields that run as high as forty-five bushels per acre, but of course these were exceptional.

Oats was a full crop, and no doubt Stark will take her place at the front among her sister counties. It was also of excellent quality.

Corn was a magnificent crop. With the moist after-harvest and wet fall season, the corn could hardly stop growing, and consequently it was not as fully ripened as it would have been with a dry fall, and we have to record that some which went into the crib with prospects of drying out, is inclined to mould some. At this writing, January 14, 1889, very little cold weather has been experienced, very little snow—but lots and lots of rain.

Rye, buckwheat, clover and barley are seldom raised in mentionable quantities.

Among fruits we had plenty of apples and peaches, cherries and plums. Pears were not as abundant as could have been wished.

The small fruits of all kinds were abundant, and at remarkably low prices; in fact, so low that they ceased to be profitable to the growers.

Celery, of which immense quantities are being grown, was very fine, owing to the cool, moist season. One grower has seventy acres employed in growing this plant, and finds markets for it in Cleveland and eastern cities. Of course he, making a success of it, has induced many amateurs to embark in it, and swampy muck lands that a few years ago were the "eye-sores" of many a farm, prove now to be the most valuable land on the farm, and are made to "blossom as the rose."

Potatoes yielded prolifically, many large yields being reported. Tubers were well grown. There was comparatively little rot; the season being cool can be credited with that, as it was so wet that great difficulty was experienced in lifting them.

There is a constant watching and yearning for the newer varieties of grains, fruits and vegetables among our people, and they will not be behind in the race of life if they can help it, as our last county fair attested.

If county fairs are an index of the county, or a glass in which the standing of its citizens is reflected, then we wish all could have beheld our last county fair. We have held big and successful fairs in the past few years, each succeeding fair outstripping or outdoing its predecessor, the last one having reached the climax, only to hold the place for one year in its turn.

Ours is not a "horse fair," but all interests are balanced as nicely as is possible to do, and hence a greater number are interested in the fair and grace it with their presence and dollars. And while we paid a trifle over \$1,300 in the whole horse department, where some horse fairs pay two and three times that amount, yet we doubt if another county fair in the State could show such a fine exhibit of 279 horses. Think of it, 279 horses of the best any county affords, parading around the ring once each day of the fair, and think of a finer spectacle, if you can. This is one of our most popular features—the daily parade—headed by the band, and followed by all cattle that can be led—and, frequently, flocks of sheep.

There is a steady improvement in all the different kinds of stock, and it is a difficult thing to find a "pure scrub" stallion, bull, buck or boar in the county.

The live stock department at the fair was very complete. The society built since last fair eighty box stalls for horses, costing upward of \$1,200. Also erected one of the finest grand stands in the State, 38x156, with

apartments underneath for dining-rooms, booths, etc., costing a little over \$3,000. Within the last five years our society has expended upwards of \$9,000 in permanent improvements; in addition to above, erected a fine Art Hall, poultry house, and an "apiary," besides stabling, hay-barns, etc.

There is great harmony existing between the Board of Managers—who are usually re-elected eight or ten times—and the patrons of the fair, and we bespeak for the fair of '89 yet greater things than have come to pass in the past.

To convey a better idea of our methods of farming that we would be able to give, we subjoin a few statements of the yield of crops and the manner of growing them, as filed with the secretary at the time of making entries. Premiums were offered for best two acres corn, wheat and oats, and one-fourth acre potatoes.

Wheat, 2 acres—Jacob Draime, 1st, \$15.00. Mr. Draime says the wheat was raised on a clay soil, preceded by clover one year; no fertilizers of any kind used; sowed $1\frac{1}{2}$ bushels per acre; cultivation, ordinary.

EXPENSES.

Plowing two acres, one day.....	\$3 50
Cultivating and sowing.....	1 75
Seed, 3 bushels, @ 80c.....	2 40
Harvesting and threshing.....	3 50
	<hr/>
	\$11 15

The State of Ohio, Stark County, ss.:

Before me, a justice of the peace in and for said county, personally appeared William Prutzman and John Aemann, who made solemn oath that they measured the ground accurately, taking as their standard 43,560 square feet to the acre, and that the ground measured, with that as their standard, 87,120 square feet, and the product accurately weighed 3,840 lbs., or 64 bushels of wheat—or 32 bushels per acre.

FIRST PREMIUM—\$10.

The oats was as follows: There was 87,120 square feet of surface, and the product was as follows: By measurement was 83 bushels per acre, of 38 pounds to the bushel, and weight 98 bushels and 18 pounds to the acre.

J. DRAIME,
JOHN AEMANN,
W. PRUTZMAN.

Sworn to, and subscribed before me, this 22d day of September, A. D. 1888.

A. J. FULMER,
Justice of the Peace.

Two acres oats, gravelly soil, preceded by corn, without fertilizer; sowed broadcast, $2\frac{1}{2}$ bushels per acre; preparation ordinary.

EXPENSE.

Plowing, cultivating and sowing.....	\$5 25
Harvesting and threshing.....	3 00
	<hr/>
	\$8 25
Seed, 5 bushels, @ 35c.....	1 75
	<hr/>
	\$11 00

The above is a correct statement of the soil, cultivation and expense, etc.

JACOB DRAIME.

SECOND PREMIUM—2 ACRES OATS.

State of Ohio, Stark County, ss.:

Samuel Druckenbrode, being first duly sworn, says that he had the two acres, from which the oats crop was harvested, accurately measured before harvesting; that the crop was weighed by disinterested persons, and the amount of the crop from said two acres was 183 bushels and 26 pounds; that the soil was gravelly, and fertilized with lime; that the crop was preceded with a crop of corn, at which time the land had been manured; that the amount of seed used was $2\frac{1}{2}$ bushels per acre; that the crop was seeded the second week in April.

SAMUEL DRUCKENBRODE.

Sworn to before me, and subscribed in my presence, this 22d day of September, 1888.

M. E. AUNGST,

Deputy Clerk Probate Court.

State of Ohio, Stark County, ss.:

Harvey Harter, Henry P. Miller, and I. B. Druckenbrode, being first duly sworn, depose and say that they measured two acres of oats raised by Samuel Druckenbrode; that said measurement was accurate and correct, as they verily believe; that they accurately weighed said crop, and find it to be 183 bushels and 26 pounds, and that they are disinterested parties thereto.

HARVEY HARTER,
HENRY P. MILLER,
I. B. DRUCKENBRODE.

Sworn to before me, and subscribed by said Harvey Harter, Henry P. Miller and I. B. Druckenbrode, this 22d day of September, 1888.

M. E. AUNGST,

Deputy Clerk Probate Court.

THIRD PREMIUM—2 ACRES OATS.

State of Ohio, Stark County, ss.:

This is to certify that we were employed by S. L. Correll, of Plain township, Stark county, Ohio, in measuring the land, cutting, threshing and weighing the oats on the following described quantity of land: Actual measurement of land, two acres and thirty rods. Quantity of oats, by actual weight, one hundred and fifty-nine bushels and two pounds.

DANIEL KANDLE,
CHARLES KAISER.

Sworn to and subscribed in my presence this 19th day of September, 1888.

M. K. WETTOCH, J. P.

The land on which the above crop was raised is a black loam; was a corn stubble; was plowed the last week in April; was harrowed once, and sowed broadcast, sowing two and one-half bushels of oats per acre. The ground was then harrowed twice, and about the 20th of May was rolled with a heavy land roller. The variety sown is known as the French oats. The cost of cultivation can easily be ascertained from the above statement.

S. L. CORRELL.

FIRST PREMIUM—2 ACRES CORN.

To the Honorable Board of Directors of the Stark County Agricultural Society:

I respectfully state that the crop of corn which I have entered for premium was grown on the field mentioned in the within statement, containing three and sixty-seven hundredths acres. The land is partly a yellow clay loam, and partly a porous black loam, and has been used as pasture land for many years without being plowed, and was therefore a very tough sod. Early in the spring, as soon as the frost was out, the land was plowed, and thus subjected to the late freezing, which mellowed it effectually. About the 12th of May, after the ground was thoroughly prepared and laid out both ways, in rows three feet and four inches apart, the corn (Leaming variety) was dropped by hand and covered with the hoe. Three plowings during the season completed the cultivation of the crop.

September 24th, 1888.

Truly yours,

A. PONTIUS.

State of Ohio, Stark County, ss.:

A. Pontius, being duly sworn, deposeth and says that the statements contained in the foregoing report are true, as he verily believes.

A. PONTIUS.

Sworn to before me, and subscribed in my presence, this 24th day of September, 1888.

M. E. AUNGST,

Deputy Clerk Probate Court.

This is to certify that the undersigned were employed to measure a corn field by A. Pontius, on the 22d day of September, 1888, and upon actual measurement we found said field to contain just three and sixty-seven hundredths acres.

C. A. PONTIUS,
H. C. PONTIUS.

State of Ohio, Stark County, ss.:

Sworn to before me by C. A. Pontius and H. C. Pontius, and subscribed by them in my presence, this 24th day of September, 1888.

M. E. AUNGST,
Deputy Clerk Probate Court.

To the Honorable Board of Directors of the Stark County Agricultural Society:

This is to certify that we, the undersigned, were employed by A. Pontius from the 5th to the 13th of November, 1888, in harvesting and weighing the crop of corn entered by him for premium at the last Stark county fair. The area of the field was 3.67 acres, and the crop produced was 20,895 pounds, ascertained by us by actual weight on a standard Fairbanks scale. We also certify that we have no interest whatever in said crop of corn.

November 14, 1888.

THOS. W. LEAHY,
C. A. PONTIUS.

Sworn to before me by said Thomas W. Leahy and C. A. Pontius, and subscribed in my presence, this 14th day of November, 1888.

M. E. AUNGST,
Deputy Clerk Probate Court.

FIRST PREMIUM ON YIELD OF POTATOES— $\frac{1}{4}$ ACRE.

The State of Ohio, Stark County, ss.:

Personally came before me, George Holtz, a justice of the peace in and for said county, William Bair and George Folmer, who, being duly sworn, say that they measured a piece of ground on which Basil Folmer raised a crop of potatoes before the same were raised or harvested, and that it measured eight rods in length and five rods in width, and further say that they helped to raise and harvest the same and accurately measured, and that the same was 76 bushels and 15 pounds (60 pounds to a bushel); the potatoes are what are commonly called the "Late Rose" variety.

WILLIAM BAIR,
GEORGE FOLMER.

Sworn to and subscribed before me this 22nd day of September, 1888.

GEORGE HOLTZ,
Justice of the Peace.

The soil on which the above crop of potatoes were grown is a sandy loam; two-thirds of the piece was new ground with pasture sod on, the balance had wheat on the previous year, the first crop. No fertilizer used and no manure. Seed planted about 12 bushels to the acre, cut or sliced once through, planted in rows three feet apart, and dropped one foot apart, one piece for a hill. Cultivated the same three times; first with a common harrow, second time with cultivator, and lastly with double shovel-plow.

BASEL FOLMER,
WILLIAM BAIR,
GEORGE FOLMER.

SECOND PREMIUM— $\frac{1}{4}$ ACRE POTATOES.

This is to certify that we, the undersigned, were employed by A. Pontius to measure and harvest one-fourth acre of potatoes, that by actual measurement we laid off a plat 6 rods by $6\frac{2}{3}$ rods, making just one-fourth acre. That after harvesting and accurately weighing the potatoes grown on said quarter acre, we found the product to be 3,757 pounds, making 62 bushels and 37 pounds, at the rate of 60 pounds to the bushel; that we dug and weighed these potatoes on the 3rd and 4th of September, 1888.

HAVIER MEIER,
C. A. PONTIUS.

State of Ohio, Stark County, ss.:

Sworn to before me, and subscribed by said Havier Meier and C. A. Pontius, in my presence, this 24th day of September, A. D. 1888.

M. E. AUNGST,
Deputy Clerk Probate Court.

To the Honorable Board of Directors of the Stark County Agricultural Society:

According to the rules of your Society I respectfully state that the soil, upon which the crop of potatoes referred to in the within affidavit was grown, is a gravelly loam of moderate richness, upon which a crop of corn was grown the previous year, after receiving a good dressing of manure from the barn-yard. No commercial fertilizer was ever applied to the land; it was plowed the beginning of April, and on the 14th of April the potatoes (White Elephant) were planted in drill rows made with a large single shovel plow, about three feet apart, at the rate of about twelve bushels to the acre, the potatoes being cut, not to one eye, but in ordinary pieces containing a number of eyes each, and placed in the furrows from ten to twelve inches apart, and covered about four inches deep with the hoe. Before the potatoes were planted the ground harrowed, a liberal dressing of fresh manure from the sheep stable was applied and mixed with the soil by harrowing; just before the potatoes came up the ground was thoroughly harrowed, and afterwards the potatoes were plowed twice with the large shovel plow, and received no other dressing.

Respectfully submitted.

A. PONTIUS.

September 24, 1888.

State of Ohio, Stark County, ss.:

A. Pontius, being duly sworn, deposes and says that the statements contained in the foregoing report are true, he verily believes.

A. PONTIUS.

Sworn to before me and subscribed in my presence, this 24th day of September, 1888.

M. E. AUNGST,

Deputy Clerk of the Probate Court.

STATEMENT OF AMOUNT.

Showing that 3,675 pounds of potatoes were raised on a lot 56 feet wide, 194½ feet long, containing 10,892 square feet.

STATEMENT OF SOIL.

Soil was a sandy loam; crop preceding was orchard grass sod. No fertilizers used. Seed planted, 1½ bushels.

STATEMENT OF CULTIVATION.

Plowed in spring. Harrowed three times. Planted last week in April. Plowed with double shovel plow twice. Hoed once. Hilled with single shovel plow (once) by going once through a row. Expense for planting, hoeing and digging, \$2.30.

C. G. CORRELL.

The State of Ohio, Stark County, ss.:

C. G. Correll, being duly sworn, says that the within statements are in all respects true and correct.

C. G. CORRELL.

Sworn to and subscribed before me, this 24th day of September, A. D. 1888.

A. PONTIUS,

Notary Public in and for Stark County, Ohio.

We, the undersigned persons, measured correctly a lot 56 feet wide, 194½ feet long, containing 10,892 square feet, and weighed from it 3,675 pounds of potatoes.

G. C. PONTIUS,

N. P. OBERLIN.

Sworn to and subscribed before me, this 25th day of September, A. D. 1888.

A. PONTIUS,

Notary Public in and for Stark County, Ohio.

SUMMIT COUNTY.

On March 3d, 1840, the General Assembly passed an act creating a separate county, by taking ten townships from the west side of Portage county, four from the east side of Medina county, and two from the north side of Stark county, occupying the highlands, from which the new

county derived its name, that of Summit. The land in this county is gently rolling, except near streams, which are numerous, and quite evenly scattered over the county. These streams are fed by living springs, that supply an abundance of pure water for both man and beast, besides furnishing water-power for manufacturing purposes, Summit county being a manufacturing center, the largest part of which is in the city of Akron, its county seat.

The original forests showed a diversity of soil, the Beech, Maple, Ash, Basswood and Elm being found in some portions, while the Oak, Whitewood, Chestnut and others are found elsewhere. Where the latter are found, proves to be the best land for grain-growing, the former growing on land more naturally adapted to grazing purposes.

The principal crops raised are wheat, corn, oats, hay and potatoes, with fruits and vegetables that are adapted to this latitude. The wheat crop of this year, owing to the dry weather of last fall and this spring, was not up to its usual average, but our farmers are not discouraged; they have taken more pains in putting out their wheat this fall, and have used more commercial fertilizers than ever before.

Oats yielded well, but on account of the heavy rains at harvest time, they were somewhat damaged as to quality.

In corn, we undoubtedly had the largest crop ever raised in this county, but the heavy cold rains and cloudy weather have damaged the fodder, for which nearly all the corn in the county is cut up.

Potatoes yielded unusually well, many of our potato growers reporting an average of three hundred and fifty bushels to the acre, and of superior quality.

The hay crop was light, owing to the dry weather in the first part of the season.

Vegetables of all kinds were very fine, both as to quantity and quality. There was only a medium crop of apples, and they were generally wormy. Pears were very fine in every respect. The peaches were excellent as to quality. Of clover seed, the large kind was good, while the small seed was a failure.

Live stock of all kinds show a continued improvement. Many fine animals of all kinds are bought and sold for breeding purposes, and many more are fattened and shipped to eastern markets.

Our county fair was held, as usual, on the first week in October. Entries in all departments were very large, and of superior quality.

Horses were well represented in all classes; they were of superior merit, it being difficult in many instances for an expert judge to place the first premium. An unusually large show of cattle, of all breeds, was on hand,

the Short Horns carrying off the prize in sweepstakes for beef breeders, and the Ayrshires taking the premium on milk breeds.

In sheep the Merinos, Shropshires, South Downs, Cotswolds, Leicesters and Grades were shown. The Shropshires attracted the most attention, many of them being brought from England this summer by our enterprising sheep-raiser, Mr. J. T. Newton, of West Richfield, this county, who is giving his attention to the breeding of this class of sheep.

Chester Whites, Poland-Chinas and Berkshires were the breeds of swine shown, and those who had traveled the fairs stated that they had never seen so many fine specimens at one exhibition.

Poultry showed a marked improvement over former years. Over two hundred coops of really fine birds were shown. Since this society has adopted the one judge system, employing an expert, the show has been increasing, and promises to do so in the future.

The display of farm products was very fine, especially in vegetables, potatoes taking the lead, the largest display coming from E. E. Stine, of Cuyahoga Falls, who showed over *six hundred* (600) different named varieties of his own raising, undoubtedly the largest exhibition of this vegetable ever shown on the face of the globe, and does credit to the exhibitor.

The display of all kinds of fruits was very fine, both as to quantity and quality.

The display in flowers and plants was very superior; and in fact, our floral displays are always large and grand.

In domestic manufactures and household fabrics, the display was probably the finest ever seen in the county, as was also the display in the art gallery.

Neither were our merchants behind in their showing, every available foot of space in our mercantile hall being filled with displays of the finest of goods.

As to agricultural implements and machinery, they could only be measured by the acre, and if entry cards had been attached to every piece shown (as is done at many fairs), it would have increased our entries to at least 10,000.

Taking the display as a whole, it was probably equal to that of any county fair ever held in Ohio, or elsewhere.

In conclusion, we will say, that our farmers, as a class, are intelligent, industrious and enterprising, and fully up to the times in all that pertains to their business.

TRUMBULL COUNTY.

Trumbull county held its forty-third annual fair at Warren, Ohio, September 6, 7 and 8, 1888, being perhaps as old a fair as exists in Ohio. The weather had been very dry up to the second day of the fair, when a hard rain set in, about 10 A. M., and rained all day, and hard all that night, stopping next morning in time to allow a good sized crowd the last day; but the rain caused, undoubtedly, a loss of two thousand dollars to the society, although we realized enough to pay all premiums, expenses, etc., but had to be content with small profits. The greatest display of horses ever made was at this fair; about seventy different horses were for speed, excelling anything in that line in its history. Horse-breeding is being one of this county's leading industries in nearly every breed of horses.

Durhams, Alderneys, Holsteins, Herefords and Devons are the leading breeds of cattle, in the order named, while crosses and grades from the different herds form many of the dairy cows, which make a large industry in this county. Sheep, swine and poultry were also a good exhibit. This year was too dry in early season for a large hay crop, but oats never before equaled the acreage and yield of this year. Wheat was only an average. Potatoes, in great abundance and over-supply, sell for twenty and twenty-five cents per bushel. Apples were largely killed by a frost as they were forming, and are a small yield. Grapes and small fruit were generally a large yield. This county is well adapted to farming, grazing, stock-raising, fruit-culture, etc. Excellent schools abound throughout the county, and no township is without its churches. The coal-belt in the south-eastern sections still produces large amounts of coal, which runs numerous rolling-mills, furnaces, and various machinery, in different sections. Taken as a whole this has been a bountiful year for this county.

E. D. KENNEDY, *Secretary.*

TUSCARAWAS COUNTY.

The thirty-eighth annual fair of the Tuscarawas County Agricultural Society was held on their fair grounds at Canal Dover, Ohio, October 2, 3, 4 and 5. In some departments the fair was more than ordinarily successful; in others there was a falling off both in numbers and quality exhibited. The horse and hog exhibits were unusually fine, both in number and quality; while the sheep and cattle departments were not quite up to what they have been. Unfortunately for this county we have too many fairs, there being three in the county, and the dates of two of them coming in the same week, but notwithstanding this fact we had a very

successful fair. We have increased our premium list to such an extent, in all departments, that we offer almost as much money and encouragement to exhibitors as any county fair in the State, and the competition in all live stock departments is annually increasing.

Wheat, corn, oats, hay and Sweitzer cheese are the principal productions of the farms of this county. The crop of wheat this year was short, especially in the hills, in some instances not getting their seed. Hay was also very light, and consequently higher in price than for many years, while the corn and oat crop was large, but owing to continued wet weather it was with difficulty harvested, and a great deal of it was damaged, but we will still have a large surplus. The fruit crop of all kinds was large, and a great deal shipped to other markets.

Sweitzer cheese is receiving, annually, more attention, and a great many of our Swiss and German farmers, with which this county is largely settled, are buying cows and hauling their milk to the dairies. The past season was favorable for a large production, owing to the wet season and the summer and fall growth of grass. It finds a ready market in the eastern cities, while some is shipped west, and the prices have been well maintained. Although our hill farmers find it more profitable than growing grain, it is exercising a degenerating influence among the cattle. Cheese men care nothing for the quality of calf they produce; their object is milk, and then market the calf to the butchers for veal. Owing to the great mineral production of Tuscarawas, our county is well diversified with railroads, being seven in all, which affords our farmers good shipping facilities.

In conclusion we have to say that our farmers, as a general rule, are growing annually better off, and less land is exposed for sale than for years.

UNION COUNTY.

The past year has been one of more prosperity to the farmers of Union county than for several years previous. The crops were unusually good, except of wheat, and the prices obtained have been satisfactory.

The geological formation, kind of soil, and general description of the county, were given in our last report, hence it is sufficient to say that we have a rich and varied soil, well adapted to the production of all the staple crops, and as a stock-raising county it is one of the best in the State.

The corn crop was simply enormous, being much greater than ever known before, but the wheat crop was almost an absolute failure. There was an excellent yield of hay, oats, clover, rye and barley, and all of fine

quality. Vegetables of all kinds did well, especially potatoes, their yield being the best in quantity and quality that we have ever known.

The fruit crop was remarkably large, especially as to apples, grapes, cherries, peaches, pears, plums, strawberries, black and raspberries.

The fair was held October 2, 3, 4 and 5, 1888, and was one of the most successful in central Ohio, notwithstanding the distractions of a heated Presidential campaign and the centennials at Columbus and Cincinnati. All premiums were paid in full, as usual, and that, too, without resorting to a loan. All the different departments were well filled, notably that of the poultry department, which excelled the display of any previous year.

Our county is noted for the raising and shipping of heavy horses and Short Horn cattle, and the exhibits in these departments are always the great attractions of our fairs. Chester White and Poland-China hogs are the swine of the county, and the different varieties of fine wool, long and down sheep are raised successfully.

Marysville, the county seat, is thirty miles northwest from Columbus, and is the center of a thriving business, because of the wagon-roads that lead into the town having been improved by grading and graveling, under the turnpike laws of the State, all of which are free to the public.

In addition to present railroad facilities, we confidently expect the completion of the Columbus, Lima and Northwestern railroad through the place during the coming summer. Marysville is a pleasant, healthful town, and especially so since the recent discovery within her borders of one of the most valuable medical springs in this country. The town is much in advance of the majority of her sister cities of equal size, owing to her system of lighting; the streets, business houses and dwellings being lighted by electricity.

Respectfully submitted.

E. W. PORTER, *Secretary.*

VAN WERT COUNTY.

The Van Wert County Fair was held on the fair grounds, near the town of Van Wert, September 4th to 7th, and was a representation of the advanced state of agriculture in the county. The number of entries exceeded by six hundred those of any former year. The society has spent over \$3,000 the past two years in improving the grounds. The receipts and disbursements show a deficit in the year's business, which came about by the necessity of building an agricultural hall and sheep house. The show, in every department, except cattle, was an improvement over that of any former year; the deficit in the cattle department was said, by our cattle men, to be caused by the cattle not being in good condition, owing to

the fact that the seasons of 1887 and 1888 were extremely dry, and the permanent pastures, while they kept up very well in 1887, seemed to get discouraged and fell off in 1888.

The display of Normans, Clydes, English Draught and Cleveland Bay horses was very fine indeed, and very few counties in Ohio could have equaled it.

All farm crops in 1888 were fairly good, but none especially so. Sometime in July the county was visited by one of the hardest rains ever known here; this was followed by a long drought; in fact, we had no rain of any consequence until late in October; thus the potato crop was injured and the potatoes were small. Early in September the county was visited by a killing frost, which injured the late corn. There was an abundance of all kinds of fruit, but apples were smaller than usual, caused by trees being overloaded. All kinds of stock have been healthy; no hog-cholera worth mentioning. Natural gas has been found near the county seat in sufficient quantities to supply the town with fuel.

Van Wert appeared at the Centennial very much as a young lady makes her first appearance in society where she has three or four elder sisters still unmarried. No matter how handsome, how witty, or how wise she is, she is looked upon as only a child, and but little expected of her, and her accomplishments rather accredited to her family than to herself. But notwithstanding the disadvantages under which she labored, she finally compelled respect for her own worth. She presented her certificate of promotion in the school of progress, and stood upon her dignity, knowing full well that her fertile acres, well drained and well cultivated under the master hands of intelligent labor, would not fail her. She placed in the foreground of her display samples of the foundation of her greatness, the soil—and great was the wonder and admiration elicited. It was admitted that for depth and fertility it exceeded the best of the Miami bottoms, that have long been considered the garden of Ohio. There on rising steps she placed her products—corn, wheat, oats, rye, barley, buckwheat, flax, hemp, clover, timothy, alsyke, white clover, red-top, blue-grass, orchard grass, beans, peas, potatoes, sweet potatoes, onions, yams, mangos, beets, raddishes, parsnips, carrots, hops, sage, sorghum, pumpkins, squashes, melons and citron. Above these she placed a magnificent corn palace and Independence Bell constructed out of corn. In the display was found nearly every article that is known to the American farmer. As to agricultural display, we think it will be a long time before there will be another exhibit as complete as ours, either in quality, quantity or artistic display. In number of varieties and in quality we were far ahead of any exhibit on the ground. The enumeration of a few articles we think will not be out of place. Of corn, we had 81 varieties; wheat, 80

varieties; oats, 30; grasses, 35; potatoes, 69; while in vegetables we had the largest number of varieties, and some of far the best quality, while others were surpassed by other counties.

The above is taken from the report of T. S. Gilliland, one of the commissioners in charge of the Van Wert county display at the Centennial. The only reason given why Van Wert failed to get one of the premiums was, that she failed to exhibit butter, cheese and honey, all of which we could have shown in abundance, but we made the mistake of supposing that such articles did not properly belong to a display of agricultural products.

VINTON COUNTY.

To the Hon State Board of Agriculture:

In compliance with the statutes, we herewith submit a report of the condition of agriculture in our district.

The Southern Ohio District Fair is conducted and under the management of The Southern Ohio District Fair Co., an organization duly incorporated under the statutes of the State of Ohio.

The society is organized in strict compliance to the statutes providing for the organization of county and district fairs; and it includes in its organization the counties of Vinton and Jackson.

The agricultural interests of our district are not in the most flattering condition, owing to the fact that the interest in that direction has been somewhat diverted by the vast mineral resources of this district. There, however, seems to be a very noticeable improvement in the right direction, and our farmers are beginning to realize that they have neglected their best interest by devoting too much of their time to the development of the mineral wealth of the district, when at the same time the exceptionally low price of our mineral products has rendered their labors almost entirely unrewarded.

The stock-raising interest, we are happy to note, is in the line of improvement; such is especially true of horses and sheep. Vinton and Jackson counties are admirably adapted to the raising of sheep, and we are highly gratified at the marked advancement of this important industry.

Our soil is adapted to the growth of all kinds of grain, and the farmer who adopts scientific principles in farming, and uses a reasonable amount of fertilizers, is rewarded by abundant crops.

The fruit-growing interest has been somewhat neglected, but many of our farmers are putting out large orchards, and if the improvement in this

direction continues, it will be but a few years when Vinton and Jackson counties can boast of being among the best fruit-growing counties of the State, a distinction to which they are justly entitled, if their natural advantages are properly improved.

Respectfully submitted.

D. WILL, *Pres't.*

A. E. McGRATH, *Sec'y.*

WASHINGTON COUNTY.

The thirty-seventh annual fair of the Washington County Agricultural and Mechanical Association was held on the grounds of the society, near the city of Marietta, September 12, 13 and 14, 1888.

This being Centennial year, and the people of our city and county having devoted a great deal of time and attention to the two celebrations held here in April and July, the interest in and attendance during the fair was not as satisfactory as it otherwise might have been.

The exhibits were good; in some departments exceeding previous years. The show of horses, especially draft and all purpose, deserve especial mention. In the cattle department, Short Horn, Devons and Holsteins were well represented, both in number and merit of the stock shown. The sheep department was well filled, principally fine wool. The exhibit of hogs was not large, but some very fine specimens.

The society, though some in debt, is in a satisfactory and prosperous condition, having a membership of 115. The management during the past year have made some valuable and much needed improvements on the grounds in the way of permanent stables for stock and fencing.

The association, during the year, has had the assistance of the people of Marietta and county, who raised, by subscription, a guarantee fund of several hundred dollars; that encouraged exhibitors and awakened interest in the association.

Our society adopted the "one man," or expert judge, or committee on live-stock, and were more than pleased with it, and recommend the same to other fairs.

The potato crop was very much injured and the yield lessened by very hot weather from about June 10th to the 20th, during which it was also very dry.

The wheat, oats and corn crops suffered from no insect or other source until about the last of August and later, when continuous rain did much damage to all of said crops.

The principal crops of our county for the past year were, corn, wheat, oats, potatoes, apples and sweet potatoes, the estimated acreage and average yield per acre of which, is as follows:

	No. acres.	Estimated amount.	Average yield per acre.
Corn	24,000	964,000 bushels.	36 bushels.
Wheat	34,000	300,000 "	10 "
Oats.....	12,000	200,000 "	15 "
Potatoes	2,000	75,000 "	30 "
Sweet potatoes.....	200	25,000 "	125 "
Orchard (apples)	12,000	1,000,000 "	90 "

The apple crop was the largest ever known in the county; the orchards out-did themselves. We think perhaps the estimate herein is low. The farmers of the county have recently given more attention to the orchard, and have received an early response.

Most respectfully submitted,

L. W. ELLENWOOD, *President.*

E. S. ALDERMAN, *Secretary.*

WAYNE COUNTY.

The Wayne County Agricultural Society held their second annual fair under the new organization, on their leased grounds, October 2, 3, 4 and 5, 1888. They, like most other societies in 1888, had to contend with the unceasing rain. The first, and also the last day, rain never ceased to fall, and decreased the number of entries which would have been made, although our entries were almost twice as large as in the year 1887. The last day the attendance was small, and had the weather continued fair the attendance would have exceeded that of any former day during the fair.

The condition of agriculture in Wayne county at the present is very encouraging, and the most enterprising of our farmers are organizing Farmers' Clubs, and meet three or four times a year, and discuss the principles involved in the newer and improved methods of farming. We have a few men in our county who have broken away from the old methods and adopted the new plan, and appear to be highly pleased with the change.

Our county has not lost its prestige in ranking among the foremost in the production of wheat. This crop, the last season, was very good for

this season, and as far as we are informed ranks first in the yield among the counties of the State.

The corn crop was an immense one, the yield excelling that of former years, and owing to the wet weather in October and November, it puzzled our farmers to know how to gather it and prevent it from spoiling in the crib.

The oats was also a good and paying crop, and is one of our staple summer crops.

Vegetables of all kinds are raised in abundance. The potato yielded more to the acre than in former years, and there was over 12,000 bushels shipped out of the county from Wooster alone.

Stock-raising is quite an industry. The horse is raised extensively, and the principal breeds are the English Shires and French Norman for draught, and the Cleveland Bay for road and coach horses. We have a number of buyers in our county who ship to the Boston market the heavy draught horses raised in our own and adjoining counties.

Hogs are also a favorite with the farmer here, and the large corn crops are usually fed to these animals, and in that way the farmer profits from the extra amount of weight added from good feeding. We have never had a case of hog-cholera in our county, and in fact all kinds of stock are, and have been healthy.

The fruit crop was only an average one this season. The apple and peach seemed to be covered with a small black speck, and did not become as large and perfect as it usually does in our county.

Berries and grapes were abundant, and all our growers had more than they could attend to and market in good shape.

Flouring mills in Wayne county are abundant, and use up about all the grain grown in the county, and frequently have grain shipped into the county in order to keep the mills at work. Their productions rank very high in the market, and find ready sale here as well as in the eastern market.

Wooster has recently had an additional manufacturing establishment start up, and will manufacture the Universal Plow, which has been on the market for two or three years, and has given good satisfaction wherever used.

The year has been one of general prosperity in Wayne county, and we have room for more energetic and industrious farmers who will settle here and practice farming on the latter and more popular plan. He who will settle down on an eighty-acre tract of land and produce as much as the average farmer on double that amount of acreage, is the farmer we want, and is the man who will prove himself a benefactor to his fellow-men.

WOOD COUNTY.

The past season has been very dry, only a small amount of rain; still the crops have been good. Wheat about the same in quantity as last year, but the quality was poor—not more than 50 per cent. of last year. Oats, more than an average. Hay, light, but of good quality. Potatoes average only about ten bushels per acre. The improvement in agriculture is most marked, and the old-style farmer is a thing of the past.

The farmers are improving their horses by using nothing but imported stock or high grades; the same with cattle, and the time is not far off when Wood county will go to the front in stock. Not many mules owned or raised. We have had no cholera among our hogs to speak of; not as many raised as formerly. Sheep, not very plentiful. The corn is mostly drilled here, and is one of the main crops, though there is a large acreage of wheat and oats grown, these being main crops. Farmers are turning their attention to a greater variety of crops than formerly, and the county shows a marked improvement in consequence.

FRANK POWELL, *President.*

J. S. MATTHEWS, *Secretary.*

LECTURES AND PAPERS

DELIVERED AT

FARMERS' INSTITUTES,

HELD IN

DIFFERENT COUNTIES OF OHIO, DURING WINTER OF 1888-9,

UNDER THE JOINT AUSPICES OF THE

OHIO STATE BOARD OF AGRICULTURE, OHIO STATE UNIVERSITY,
MIAMI UNIVERSITY, OHIO UNIVERSITY, AND THE VARIOUS
COUNTY AGRICULTURAL SOCIETIES AND LOCAL
INSTITUTE ASSOCIATIONS,

TOGETHER WITH

REPORT OF SILO CONVENTION,

AND A CONSENSUS OF OPINION AND RESULTS OF EXPERIMENTS WITH
ENSILAGE AT SEVERAL EXPERIMENT STATIONS.

CLOVER *vs.* TIMOTHY.

BY T. B. TERRY.

I do not know how it is in this county, but where I live timothy is the main hay crop. There are some fields of clover, but these are greatly in the minority. Now, let us look into the matter a little, as to which is the better crop for the general farmer, who raises hay to feed out on his farm. If the hay is to be sold in market, of course timothy is the kind that is wanted. But the great mass of farmers find a market in their own farms.

What shall we say about timothy? Well, it makes good, first-class hay. It is but little work to cure it. In a warm day it can be cut and put in the barn without standing out over night. The seed is only about one-half as expensive as clover seed. Take one farm with another, timothy will yield about as much hay at the first cutting as clover. These are good points, and I fear a great many farmers are satisfied with them, and do not take the trouble to hunt up, carefully, the points in favor of clover. Let us consider them in detail:

First, as to the quality of the hay: If cut at the right time and properly cured, after feeding hundreds of tons of it, I must say I consider it rather better than clear timothy, for all farm feeding, except to horses that are to be driven fast on the road. It might be as well for them if given but a small quantity at a feed. For horses working on the farm, I consider clover far superior to timothy. I have one team that has been fed on clover hay only, the year round, for six years. They have done plenty of hard work, but not once during the six years could one see a rib on them. Thus fed they are always healthy and bright, and ready for work. We sow a little timothy with our clover seed; so when I speak of clover, I mean clover with a little timothy in it—some years one-fourth, sometimes less. For making milk or beef, give me such hay in preference to clear timothy, every time; and I think all farmers who have fed quantities of good clover hay will agree with me. Where clover has been allowed to stand until dead ripe, or nearly so, before it was cut, I know it would be given a hard name, and it ought to have, for it is then hardly as good as bright straw; but I am not speaking to men who do business that way, I hope. I feel that you will all agree with me, at least, that a good article of clover hay is fully equal in feeding value to timothy, and we will let the feeding value stand there.

Next, let us look at the work of curing. It is rather more work to make clover hay than timothy, particularly in a catching time. If the weather is dry, and hot and settled, then it is but very little more. I fear many farmers do too much work on their clover hay. Last summer I cut six acres, one afternoon, beginning about 2 o'clock. This was just as the weather was clearing after a storm; it was so cool, and partly cloudy, that it would not cure so as to take any harm, lying in the dew that night. The next day was bright and hot. In the afternoon I raked the clover into large windrows. My men spent the day in the potato field. The next day, after the dew was all off and the hay warm, we turned the windrows over, and when they were warm all through we began drawing in; fourteen loads were rushed into the barn, and the rest thrown up into careless piles, as there was no danger of rain. Towards night I mowed some more, so as to have it ready to cure the next day; in this way, in three or four fine days, we shoved in some forty tons. As the ground got drier and the weather hotter, what was cut one afternoon was put in the next, but always when the hay was fairly hot from the sun shining on it. The time to draw in clover hay is between 11 o'clock and 4; unless there is danger of rain; not much later; it will gather dampness very fast towards sundown, or even as early as 6 o'clock; as soon as it begins to grow colder moisture is deposited. In this way, with settled weather, clover can be cured nearly as cheaply as timothy. If it had threatened to rain that week, and we had had to cock up the hay and afterwards open it, the cost of curing would have been greater. With clover we must take this risk, as it can not often, in this locality, be cut and put in the barn the same day, if cut in full blossom. In a very dry climate, and hot, dry weather, and a little late in the season, and particularly in a tight barn, this may be, and is, safely done.

Now, I will allow that on an average it costs \$1 an acre more to secure clover hay; this is liberal, as a man can easily cock up, spread out, and throw together with a fork again, an acre of heavy clover in two-thirds of a day, and \$1 is all that the labor would cost with us, and half of the time most of this labor could be avoided; but we will charge clover hay with \$1. The clover seed for an acre will cost on the average about 60 cents more than timothy; charge this up. I think no one will say that the first crop of clover will not yield as many pounds to the acre as timothy, on the average, as a rule. On very heavy soil the timothy might come out ahead; but on my lighter soil the clover is ahead, and also on the heaviest clay where it is underdrained. I think we may pass over this point and call clover equal to timothy.

So, now, if we call clover-hay equal in feeding value, acre for acre, to timothy, we have the clover, costing \$1.60 at most. Now let us go on.

How much second crop does the timothy meadow produce? In a dry year, as the past has been,* nothing. I can show you hundreds of acres that never greened up the second time; some may have furnished a trifle of feed, but they were few and far between in our locality. Within a mile of my farm I can show you large fields that were as brown as the road all through the fall. Now, how does clover act in such a dry time?

If you will pardon me, I will tell you just exactly what mine did. I had 12 acres that produced the 40 tons of hay, as estimated. I cut the second crop for seed, and hulled out 27 bushels of No. 1 seed, besides 5 bags of tailings, which, when cleaned up, will make about 3 bushels more seed. The labor of cutting the seed (I did it in a day) and stacking it was worth \$16, the hulling cost \$24; I expect to get not less than \$174† for the seed and have the hullings for manure. This leaves me \$130 clear money, or about \$11 an acre to go to the credit of clover, as timothy meadows near by produced nothing meanwhile. This is fully equal to the average wheat-crop of our town—more than that of the State; but \$11 an acre for a wheat crop means a large loss; \$11 for a crop of clover seed means a fine profit. As you may think this was a phenomenal yield, I will say it was the smallest I ever had. It grew literally without any rain that reached the roots. In a good season, when timothy meadows produced a little fall feed, I have harvested \$21.50 worth of seed per acre.

You may say that if every one went to growing clover seed it would be lower soon. Very true; but every one won't, and there is no law against one's raising what pays best. No crop on my farm pays such a percentage of profit on the cost of production as clover seed. But I must credit up the \$11 an acre to clover and go on.

Suppose one wants to grow corn, or potatoes, or wheat on the land next season, which will bring the best crops? The clover sod or the timothy? There can be but one answer to this—the clover will. Particularly will the clover sod help wheat and potatoes. It is easier to state this fact than it is to tell why. As far as we *know*, clover does not get much nourishment from the air; it is said to bring it up from the sub-soil by its long tap-roots, and to have the ability to get it out of the soil where some other crops could not, and then, dying, leave it for them, just as the steer can eat grass and make meat that will nourish us, although we would have starved on the grass. This may be all the ability that clover has, and it may be found, as is quite probable, that it draws much of its nitrogen from the air; but meanwhile it does not make very much difference to us farmers, as long as it gets it from some quarter. We should, of course,

*This paper was written in the fall of 1887.

†This estimate proved a little too high for that year.

be just as careful to save all our manure, for we never can get enough; but there are thousands of farms where, if clover was substituted for timothy, without using any more fertilizer, 25 per cent. larger crops could be grown. Now, I do not make this statement carelessly or hastily, but after eighteen years' experience with clover sod for crops, and in watching what timothy sod produced on similar land in my vicinity. If timothy sod brings 20 bushels of wheat, a clover may be relied on, with the same chance, to bring 25 bushels. If a timothy field brings 100 bushels of potatoes, look for 125, or more, in the clover lot. Some of you may dispute this statement, and perhaps from experience. Well, how long did you let the clover grow? It should be cut for hay and seed but one year, then plow it, and it will show what it is worth. Some mow for years until the clover is all gone, and the fertility it stored up has been used up by the timothy that came in; such a sod is not a clover sod. One should get a good stand of clover, mow it for hay, or hay and seed, one year, and get maximum crops, and then plow it that fall, or the next spring, while the soil is filled with roots, then he is on the road to the maximum good to be obtained from growing clover, and after a few years' experience he will agree with me that for this purpose alone clover is worth, at a low estimate, \$5 an acre over the timothy, because it can find in some way fertility that timothy can not, and when the sod is turned under yields it up to other crops that we sell for money.

I haven't told all in favor of clover yet. I might tell that it will produce, after wheat the same fall, much more rowen. I have mowed as high as three loads per acre, in a wet season; but never mind any more. Let us sum up what we have got. Clover, in comparison to timothy, has charged to it \$1.60, for greater cost of seed, and because more difficult to cure. It has credited to it \$11.00 per acre for seed produced, and \$5.00 per acre for extra fertility left in the soil for future crops. On each acre, then, of clover, the farmer is ahead \$14.40. Gentlemen, that is below the truth, on the average, in my town, with prices as they have been in the past. You may ride in several directions from my farm, for hours, and not find one acre in ten, of the mowing lands, clover. This where the farmers see just what it has done for me and others who use it. Why is it? The most of them could get that \$14.40 an acre, more or less. I saw better filled clover seed this season on the heavy clay soils than mine—here and there a piece. If clover seed should be raised in such abundance as to lower the price, or if insect enemies prevent its growth,* the second crop will bring nearly as much, if made into hay and fed out, while the great benefit of larger crops on the land in the future will still remain.

* This was the case with us this year, 1888.

The farmer who feeds out all the hay he raises, and does not have one-fourth to one-third of his cultivated land growing clover each year, isn't living up to his privileges. In my rotation clover comes in every third year; so, as clover is growing with the wheat, two-thirds of the land has clover on it all the time.

In the usual rotation of corn, oats, wheat and grass, the ground should be in clover once in four years. I leave out the oats so as to get it in once in three years, and for work horses the clover hay does very well in the place of timothy and oats. But if I wanted oats I would buy them rather than lose the benefit from having the land in clover once in three years. When we can buy a thing cheaper than we can raise it, and have enough more profitable work to keep us busy, then it is poor business economy to raise it.

There may be places in Ohio where clover cannot be made to grow successfully; but I doubt whether there are many such; yes, almost whether there are any. That many farmers *think* they cannot grow it, there is no doubt; but if they could realize how valuable a crop it is, they would usually be able to find a way to make it grow.

TAXATION.

BY ALFRED SHIRER.

[Read at the Warren County and Montgomery County Institutes.]

Methinks I hear some one say a great subject for a farmers' institute. It is true it may not teach you how to increase the bulk in your granary or improve your live stock, but it may, however, be the means to increase your bank account. Let Terry teach you how to cultivate potatoes. Let Secretary Bonham inform you of the value of corn fodder. Let Hon. McLain Smith give practical hints on economical feeding. Let President Chamberlain inform you of the value of clover, backed by the overwhelming testimony of Dr. McWhinney's enormous clover growth on soil excavated from the bottom of a well 20 feet deep.

We must not forget, however, that a dollar saved is a dollar earned. It is not he who earns the most that becomes rich, but he who saves the most. It appears to me that the past efforts of our institutes have been too much in one direction, namely, in filling our storehouses and then forget to guard them. If we remember that the tax-gatherer wants about 200 bushels of wheat, or about 600 bushels of corn for his share on a 160 acre farm, is it not high time to take some definite action in regard to this

exorbitant demand of the tax-gatherer? Taxation, therefore, forms a prominent factor in farm economy. Must we forever endure this high rate of taxation? Is there no remedy? What is the object of taxation? To support the government. What are the prime duties of the government? To protect life and property. Therefore, if the direct object of taxation is to support the government, and the chief office of the government is to protect life and property, it therefore follows that which is protected by the government should bear the burden of taxation. This brings us to a very important point under discussion, namely, who ought to pay taxes? While we are arranging the tax duplicate, we must not forget the kind of government we live under. All men are created equal. All men are endowed with certain inalienable rights. All men enjoy the same life, liberty and pursuit of happiness. If all men are equal, and it is certainly so when it comes to the ballot-box; if all men have the same certain right, and this they enjoy in our public schools; if all men have the same life, liberty and pursuit of happiness, our police force is therefore in duty bound to protect the life of the poor as well as the rich, the home of the native-born as well as the domicile of the foreigner who dwells in our midst. If all have an equal share in these blessed gifts of our free institutions, it surely follows that every individual, whether rich or poor, should contribute towards the support of our government. What! Tax the poor man as well as the rich! Most assuredly. Does not his vote count equally as much? There is no greater fallacy under a representative government than to allow a citizen to escape taxation because he has no property. Taxation without representation is unjust. But the opposite side is equally true—representation with taxation is unjust. Who is the controlling influence in our elections to-day? Those persons who are not contributing a cent towards the expense of our government. And many of them in our cities and towns are selling their votes for a mug of beer or a snort of whiskey. Every one of the 850,000 voters, whether rich or poor, in the State of Ohio, should pay a certain amount of tax. It is true that the two days' labor required to be performed on the public roads may be considered as a universal tax. But this does not apply to cities and towns; therefore, the poor in the farming districts are unjustly taxed. We must come to a poll-tax—the sooner, the better. But how about the foreigner who settles in our midst and asks the protection of his life and property. I am no candidate for office, and therefore I can give my candid opinion; a good many politicians would like to, but they are afraid of defeat. Emigration is becoming a very serious question in our political economy; common justice to both foreigner and native brings me to this conclusion. Our boys must wait 21 years before they can vote; so should a foreigner. Therefore every foreigner, unless under parental care, should pay his poll-

tax in the State in which he resides for twenty-one years before he can become naturalized, and not, as the United States Congress proposes, to levy a tax of five dollars on every emigrant and deposit it into our already overflowing United States treasury. What a damper does our present law throw around our loyal mothers, who, Spartan-like, are training their brave sons to be true Patrick Henrys, who will cry when the liberties of our people are assailed, from the depths of their hearts, "I know not what course others may take, but for me, give me liberty or give me death." What a benumbing influence have our naturalization laws on our patriotic fathers who are endeavoring to infuse into the minds of their patriotic boys, those noble principles of our continental fathers, who mutually pledged their lives, their fortunes and their sacred honor to the cause of American independence.

I must emphatically affirm that it is very unjust that our sons must wait four times as long to become a voter as the foreigner, and perhaps too many of them, before they become firmly rooted in the faith and doctrine of our government, will ask Lord Sackville, "What course shall I pursue to benefit my mother country?" Therefore, the sooner the foreigner is weaned from his fatherland and is induced to take a deep interest in the welfare of our institutions, the better for the future prosperity of our country. The Supreme Court of New York has wisely decided that the telephones in their State are subjugated to taxation because protected by the State. It therefore follows that whatever is protected by the State laws should be taxed, and this most assuredly must include every individual who resides in our Commonwealth.

Therefore, the first object to be taxed under a representative government is the people who constitute said government. There went out a degree from Cæsar Augustus that all the world should be taxed. What joyful news would it be to the farmers of Ohio, if from the citadel of Washington would be thundered forth the proclamation that the whole population of these United States should be enrolled for the purpose of taxation.

Therefore, the first thing to be taxed is the people which constitute our commonwealth. Second, real estate. What is real estate? Lands, including the buildings and fences, is the general definition. But such a classification is impracticable for taxation. Infinitely better call land, irrespective of buildings and fences, real estate. The question presents itself, shall a dollar's worth of land pay a higher rate of taxation than a dollar's worth of personal property? We say no; a dollar represents one hundred cents, whether in lands, buildings, stock, mortgages or cash. All agricultural lands, whether large or small tracts, should be taxed according to their natural fertility for general farm purposes, and not according

to their cash value. The reason is so evident that by assessing it according to its cash value we offer a premium for laziness or indifference.

Some of our most naturally fertile farms are largely depreciated in value through the carelessness of their owners. But such sluggards should be compelled to pay the same rate of tax per acre as their industrious neighbors who maintain the fertility of their soils.

After the people are duly enrolled for taxation and lands valued according to their natural fertility, we next have to tackle a large class of property which goes under the general name of personal effects. Here begins the squirming, and squealing, and twisting, and lying, and cheating and swearing(?) enough to make the angels in heaven weep over the lost honesty and veracity for which the pilgrim fathers were renowned. Every species of personal property should be taxed. Remember, that I advocate the theory that real estate should include only land. Personal property, therefore, includes all the buildings, every rod of fence, all the implements and live stock, and most assuredly the domestic fowls, notes and mortgages, railroads, locomotives and cars, canals, boats and fishing tackle, machinery of every description, stock in trade, furniture, books, musical instruments, watches, clocks, jewelry, and perhaps it would be a good lesson for some if they had to pay tax on their fine clothes they bought on credit and never paid for. In short, every species of property under a representative form of government must be taxed if we wish to prosper harmoniously as a nation. What! have no exemption? Verily no. Exemptioners and pensioners are the ruination of any republican government.

Let the city, town, township, county, state and nation pay in full for the services rendered them, then there will be no need for wife, son, daughter, grandson, and so on, to ask for exemption and pension. I said, have no exemption, but I will modify the phrase, however, by saying that the debtor should have a right to exempt from his taxable property the amount he owes by notes and mortgages. Probably the best law for this species of property is that the debtor should pay the tax in full on his property and deduct from the interest of said debt or borrowed money the amount said money is taxable in said community.

Our divines are anxious to know what we are proposing to do with the churches. Tax them, of course. What, tax an institution that is for the moral good for the community at large? Pray, what are you and your farm good for? Is it possible that you are only in that good house a few hours every week and then dwell in satans' house? Spurn with contempt that delusive notion that the church building is a greater promoter of good than the very family circle. The church building and lot represents so much capital invested, and should be taxed accordingly.

How about school-houses? Tax them. What! compel a township to tax her own property? Taxing school-houses would be absurd if there was only township tax. Suppose half of the townships in the county invest twice as much in school property as is absolutely necessary—than the balance of the county—for county and State tax is assessed as much higher as the unnecessary capital invested in said school property.

How unjustly must the economical counties—on account of the exemption of county buildings—pay yearly several hundred dollars more State tax on account of their extravagant neighboring counties.

Is it not strange that churches and school-houses are exempt because they are a promoter for the general good of the community, and saloons and dogs are taxed because they are a nuisance; then on what principle are you, fellow-farmers, taxed? Perhaps you have taken the advice of that eloquent preacher whom I used to hear in my boyhood days, who used to tell his congregation, "don't do as I do, but do as I tell you." There seems to be no earthly reason—under the present classification—why you are taxed, only because you are better than the preacher and the church, for you certainly are not included in the category of those who are taxed for the meanness they do. Every true citizen should be a living monument pointing towards a higher type of civilization, and all his property, as well as the church and school-house, should be consecrated for the elevation of the human race.

The very moment we open the door for exemption, lying commences. No doubt the intention of our legislature was to favor the poor by allowing \$50 exemption. But alas, how many lies have this \$50 clause bred. Why is it that the total taxable personal property in Ohio in 1886 was \$10,000,000 less than in 1873? Is not the exemption clause the cause of this apparent shrinkage? At least once in a year the command—Thou shalt not lie—is not binding on the American people—the day the assessor appears. We find that the furniture in the poor man's cottage is worth nearly as much as that in the palace of the millionaire. The piano is out of tune, the chairs need upholstering, the Brussels carpet is faded, the gold-fringed lace curtains nearly worn out, the silverware and jewelry out of style, the horses are affected with pink-eye, the carriage needs repairing, the self-binder is almost rotted down in the fence-corner, the cows nearly froze last winter during that sleety day, the hogs have the cholera. Money—I have a little on interest, but that good, rich old deacon of yonder church only returns a mite of his fortune, so I am justified—for the sake of my dear wife and darling children—to tell a little lie.

So we find that during the last twenty years the taxable property in Ohio has not increased, notwithstanding our boasted progress, which has been heralded across the continent. But farmers, remember the glaring

fact, while the personal property has decreased \$10,000,000 during the last sixteen years, real estate is assessed \$131,000,000 higher.

If the farmers of Ohio are determined that they shall be heard, and enter this contest honestly, by demanding that every dollar's worth of property shall be taxed—and not do like the politician, tell all the lies the opposite party is guilty of in order to hide their own infamy—we can find sufficient personal property, that the rate of taxation will be far less than at present.

How much property do we see in and around Dayton, Ohio, that should in equity help to share the burden of county and State taxes. United States building, occupying the most prominent building site in Dayton.

Who is the controlling influence in our county and congressional elections—the Soldiers' Home. Who has converted the west end of our Gem City into a Sodom and Gomorrah—the Soldiers' Home. Even after Uncle Sam tells his children to enact laws to regulate their internal affairs he steps right in and opens a saloon without paying any attention whatever to the Dow law. We most emphatically assert that some of the hoarded money in the United States treasury is in equity due us for taxes.

Arouse, ye farmers, before your hands and feet are tied, like the French peasant, in 1775, when he was compelled to pay five-eighths of the income of his soil for taxes. But some one says, "how can we expect to reduce the rate of taxes when our yearly expenses increase?" This brings us to another very important point—for what purpose should our taxes be expended? We say that our State officers, every county officer, and, perhaps, most of the township officers, should be paid by direct taxation; and, if the constitution of the United States was not in the way, it would be a wholesome lesson to our people if all the United States officers were paid by direct taxation. The more the people's pocket-book—for there lies the consciences of the masses—is interested in the affairs of our government, the better. Some one says you will have us taxed to death, by paying all our county and State officers, support our public schools, maintain our roads, and other necessary improvements. There is a power yet—the ballot-box—within our grasp, to prevent unjust taxation of farm property, if we seize the occasion. We should demand of our legislature a constitutional amendment that the best farm land in Ohio cannot be taxed more than 30 cents per acre. Also, a limit to the rate on personal property. Forbidding the borrowing of money except for extraordinary damages. The total tax for the best 160 acres should never exceed \$75. Therefore, the first remedy we should seek is a limit to the taxation; not a limit, however, to the rate for real estate, but a limit to the total tax per acre. By limiting the amount of taxation it must, if necessary, regulate the salaries

of our officers and prevent recklessness in all channels for which taxes are appropriated.

Let our officers—like Gideon the Jewish judge—be called from their active labor, threshing wheat, and when their term is expired do like Cincinnatus the Roman, return again to their proper vocation. If such would be the rule, at the expiration of their term, with half the present salary, they would be richer. There is no doubt that the farmer to-day is paying more than his just share of taxation. About two-thirds of all the taxes are paid by the farmers, and all indications point that after the new appraisement of real estate in 1890 it will be worse. However, if we seize the occasion, and make it a point in electing members of our next legislature, we may get our laws in such a shape that we need not complain, like the poor Arab of Palestine, that the tax-gather of harvest time doth not only take a certain percent., but all he needs. There is no time, however, to be lost in the agitation of this important question.

Remember that the growth of cities is enormous when compared with the increase of population in rural districts. In 1860 one-sixth of the population lived in cities of over 8,000 inhabitants; in 1870, one-fifth; in 1880, one-fourth. At this rate what will it be in 1900? The larger the cities the greater the proportion of more tax-paying voters under the present law.

Some counties, you are well aware, are already at the mercy of the city folks in their political conventions. Ere long no measure for the good of the farmer can be enacted unless aid is received from the city constituents.

There are slight indications that we are drifting toward that whirlpool of destruction in which the Roman Empire was shipwrecked—by denying to the tillers of the soil their just right. Finally, in that once flourishing empire, a young man was convicted of murder, and the only testimony produced was that he lived in the country. We hope and trust that our suspicion will never be realized. But, instead of those dark forebodings which seem to be lurking in the skies, may the God of Bunker Hill, and Concord, and Lexington, and Gettysburg raise up a hero that will lead the farmer from the land of oppression to the promised land of equal rights.

We do not know what shall be our future weal or woe, but we do know that there is a growing sentiment to put all taxes on land. We do know that mortgages and notes are not honestly returned. We do know that personal property in the form of commercial business and manufacture is not honestly returned. We do know that there is too much money invested in churches and public buildings to escape taxation. We do know that many officers receive too high salaries. We do know

a large per cent. of our taxes are indirectly spent for electioneering schemes. We do know that the criminal cases of our county are a heavy burden on the honest and law-abiding farmer. We do know that it is within the farmer's power to diminish the crimes of our country. We do know that too many of our township, county, State and national officers are too reckless in the expenditure of the public money. We do know that there is a strong tendency to retire at full pay, or pension, well-paid officers. We do know that if the poor, down-trodden, low-salaried tax-payer dies in the harness, his family must either strive or starve. We do know that our legislators, both State and national, have not heeded our petitions as those of other classes. We do know that our last legislature appropriated vastly more for the State militia than for agriculture. We do know that in 1869 a few persons asked the Congress of the United States to advance the duty on steel rails, and they advanced it to \$28 per ton. We do know that we also have a power—in the ballot—and if rightly used may obtain our equal rights. We do know that we cannot obtain our redresses by laying supinely on our backs. We do know that our independence was purchased with the blood of our farmers. We do know that if this dearly-bought liberty of our forefathers shall survive until Gabriel sounds his trumpet for all nations to surrender, the farmer must be the very back and sinew of this nation in the future as he has been in the past. We do know that exorbitant taxation drives our young men into the cities. We do know that annual efforts are made to revise our tax law. We do know that there is a large class of people whose income is vastly more than any farmer, who pay but a mite of tax. We do know that lawyers, doctors, high-salaried persons, etc., should pay an income tax. We do know that the farmers of Ohio, unless there will be a general awakening, will be unjustly taxed in the future.

While we know all these facts to be so, what is our paramount duty?

“Strike till the last armed foe expires,
Strike for your altars and your fires;
Strike for the green graves of your sires,
God, and your native land.”

GOING SECURITY.

BY WALDO F. BROWN.

LADIES AND GENTLEMEN: We often accept things which we find in our social or business relations with our fellow-men, simply because we find them generally adopted or acquiesced in, when, if we reason clearly about them, we would see that they are utterly absurd. I believe endorsing to be of this character, and propose to give what, to me, seems to be unanswerable arguments to support my position.

I am glad of the opportunity to do this, because I believe that the majority of men who follow the practice of endorsing, do it not so much because they think their neighbors need it, or because they think it based on right principles, but simply because they have never reasoned about the matter. In the discussion in a farmer's club, of which I am a member, of the topic "The farmer as a business man," one sub-topic was, "Should he ever endorse?" and I was the only one who took the negative. I was accused of selfishness by the other members of the club, but I put one question to them, the answer of which seemed to me to put them in the same boat with me. The question was this: Is there any member of this club who signs a note as security because he fears the maker of the note will not be able to pay it, and with the intention of paying it as soon as due, if the maker fails to do so; or do you sign it simply because you think there is a very remote possibility of your being called on to pay it, or merely to comply with a legal formality?

When two men trade, it is for their mutual benefit, and if there is any profit in the transaction they will be benefited by it, and certainly if there is any risk of loss they should assume it. Let us look at the responsibility an endorser assumes. He takes all the risk in another man's business, with no voice in the management, and no share of the profit if it proves profitable, but with a certainty of having the note to pay, if, through rascality, bad business management, or any misfortune the maker of the note fails to pay it. And he does this for what? FOR NOTHING, absolutely NOTHING. My banker says he does it because he is his friend. Then why should he not insure his buildings free because he is his friend? When I was preparing this lecture I called at Bradstreet's commercial agency, and asked Mr. Bradstreet this question: In which would I run the greater risk, in endorsing a note for \$1,000.00 for a certain number of my neighbors, or in placing an equal amount of insurance on the house of each of them? He replied without a moment's hesitation, undoubtedly by endorsing. And yet, while you would call a man a lunatic who would ask you to insure his buildings for nothing, you think it not at all out of place for him to ask you to endorse his note, in doing which you run a greater risk.

Wise Old Solomon, understood this matter, and gave sound precepts and advice about it. He said: "He that hateth suretyship is sure." "If thou be surety for thy friend thou art snared with the words of thy lips." "A man void of understanding becometh surety in the presence of his friend." "Be not thou one of them that strike hands or of them that are sureties for debts." I hold that an honest man does not need an endorser, and a dishonest man does not deserve one.

In multitudes of cases the men for whom others endorse are injured and often ruined by it. You cannot put a gallon into a quart measure without loss from overflow, and we have many young men starting in business who over-rate their financial ability, and not content with slow, plodding methods, imagine that they only need opportunity—capital—to develop into great financiers. They imagine themselves to be Jay Goulds in embryo. Endorsing for such men has in thousands of cases lured them to financial ruin, which has involved many others. Whenever you put your name to a man's paper you allow him to trade on your good name and capital, and this gives him a false standing, and often enables him to induce others to do the same for him, and many men have been lured to financial destruction by the mistaken kindness(?) of friends.

As I do not expect to convert all my hearers from a system so thoroughly entrenched as this, I will lay down a few rules to guide those who are not yet ready to say that they will never endorse. First. No man should accept as an endorser any one whose paper he would not be willing to endorse. I once had a narrow escape. I had bought a bunch of cattle and arranged to get the money at bank for ninety days to pay for them, and a neighbor had promised to meet me as soon as the bank opened and sign the note. For some reason he was not on hand at the appointed time, and as I had some distance to go, I felt somewhat impatient. A man holding the office of revenue collector for the district, and who was reputed to be wealthy, overheard me tell the banker that I was waiting for my endorser, and stepped up with a smile, saying, "I shall be most happy to put my name to your note." I confess I felt rather flattered, but a year later, when he died a bankrupt, and I found scores of men who had loaned him money or endorsed for him, were defrauded, I realized that I had made a very narrow escape, for had he asked me to endorse for him I should have felt in honor bound to do it, and as his estate did not pay ten cents on the dollar, I should have had the money to pay.

Second. No man should ever endorse as a mere formality, but in doing it he should realize that it means he is to pay the note if the principal does not, and he should not sign it unless he intends to pay it if he must, without protest, law-suit, or delay.

Third. He should never endorse a note for an amount that would cripple his business, defraud his creditors, or deprive his family of support or education. In other words, no man has a right to risk that which is not his own, and the man who brings a family into the world is under a moral obligation to support and educate them, and has no right, unnecessarily, to risk the means needed for this purpose.

Fourth. No man should endorse without the consent of his wife. I am addressing farmers, and I think no other class of men owe so much of

their prosperity to their wives as do the farmers. A great majority of them begin life with but little capital, and if they ever accumulate enough to pay for a farm it is because of the industry, frugality, and hearty co-operation of the wife, and she should be considered and treated as the business partner. We would brand any man as dishonest who, having formed a business partnership with a neighbor, would sign the firm name, either as principal or endorser, to notes without the knowledge or consent of his partner, and I look upon it as much more reprehensible for the farmer to do this without the knowledge or consent of his wife. I have in mind now an instance where a friend of mine, whom I will call Mr. A, was saved from a heavy loss by consulting his wife. He had for years refused to endorse for any one, and had very decided conviction as to the risk of so doing, but a peculiar case was presented to him. A brother officer in the church, with whom he was on the closest terms of intimacy, and who was, to all appearance, doing a very prosperous business, wanted \$2,500.00 from the bank for (as he represented it) a special purpose, and urged Mr. A to endorse for him. Mr. A felt that here was a case to which his ordinary objections did not apply, and had he not promised his wife never to endorse without her consent he would have at once signed the note. But remembering his promise, he told the man that he must consult his wife. She at once said, "you shall never sign that note with my consent." To show his confidence in his friend, however, Mr. A loaned him a few hundred dollars without security, and promised him more in thirty days, but before the expiration of that time he made an assignment and Mr. A lost every dollar he had loaned him.

I am often asked by those to whom I present these arguments, "what is the remedy for this evil?" To my mind it seems perfectly plain and simple. I propose to put this entire business of security, whether for official bonds or private business, on the same footing as insurance. If it is worth something to have the payment of a debt made safe and certain, it ought to be paid for, and by the parties directly interested in the transaction. Companies should be formed who would furnish bonds to secure the payment of all notes, and charge a per cent. for so doing; and from this per cent. be paid for the risk and trouble, and accumulate a fund to meet losses. I believe the fact that a loan thus secured would be perfectly safe, and would enable the borrower to get it at enough lower rate of interest to nearly or quite cover the fee to be paid. It is next to impossible for the private individual who is asked to endorse a note, to know the business standing or habits of the man who asks his signature; but with a company, organized for this purpose, it would be different. The agents of the company would soon know the standing of every man in the community, and they would keep an eye on the men for whom they had

furnished bonds, and if his habits were bad, or he was living in a style beyond his means, when he wanted his bond renewed he would be refused. It would be for the interest of this company to see that defaulters were punished, and more men would be brought to justice than is now the case, and we contribute less to swelling the population of Canada.

I believe it to be a healthy sign of the times, that to-day it is easier to convict defaulters than it was a decade ago. The moral sense of the community has been awakened, and it has been found that money will not save men from the penitentiary now as in former days. The fate of Harper, Baldwin and Hopkins, of the Fidelity bank, is a wholesome warning to the men who handle other people's money. I hope to see this sentiment strengthened, until reckless speculation, whether it makes a millionaire of the speculator, or wrecks the fortunes of his trusting victims, shall be branded as a crime, and when corners in the products of the farm shall be made a felony. Had I time, it would be interesting to give here the comments and criticisms which have been made on this lecture by lawyers and others in the different counties where it has been delivered. I have been surprised and pleased that so many lawyers have heartily endorsed it, for, as I have often delivered it in court houses, I felt that it was "bearding the lion in his den" to propose something that would undoubtedly decrease litigation. The comments made by one bright professional man who had had some experience in early life in this matter, are so forcible that I will give them. He said, "It seems useless to waste a blow on a nail which has been driven to the head, but I may help to clinch it. There is one infallible remedy for this evil, and that is to learn to say NO. The man who has not the back-bone to do this has no business to walk on his feet; he ought to crawl like a baby, and instead of eating with a knife and fork, should be furnished with a nursery bottle. Old Noah Webster ought to come back from his grave long enough to invent a new word to express the utter imbecility of the man who will sign his name to another man's note."

I ask our young men particularly, to study this question carefully, and to adopt some plan of action, so that they may be ready to answer the man who asks them to endorse for him. There are thousands of wrecked fortunes and discouraged, broken-down men who might to-day be prosperous and happy had they learned to say NO when asked to endorse.

THE FARMER'S COW.

ADDRESS OF DR. W. W. CRANE, DELIVERED BEFORE THE MIAMI COUNTY FARMERS' INSTITUTE, FEBRUARY 2ND, 1889.

Before undertaking to describe the farmer's cow, I should like first to see the farmer. We once visited a farm in Louisiana, there called a plantation, where thirty or forty cows were kept. Every pound of butter used on that farm was made more than fifteen hundred miles away, in Orange county, New York. Wives of thrifty farmers of the Miami Valley, can you believe it true? it is true; when, during the day, any milk was needed in the kitchen, a colored girl was sent to the pastures to corral a cow or two and milk enough for the wants of the hour. And such cows! Their horns long and sharp; wide-spreading as the antlers of an elk. Their legs were long; their bodies lank; udders about the size of a quart measure, yielding milk, of course, in like small proportion.

The income of that place was counted by tens of thousands of dollars in the sale of sugars and sirups. No time, no thought was given to the small by-products that we all know are important—necessary to success in farming with us. Evidently the half-wild cow that roamed the broad savannas of the sugar plantation, though answering a useful purpose there, is not the farmer's cow we are seeking.

Last summer we were near a great city in the east, and visited a dairy; every cow was a pure blood of an approved butter breed; the cattle were fed and groomed as race-horses are cared for; the stable floors and trenches were cleaned, scraped, flooded, scrubbed and swept daily, until they were fairly white from the friction of constant cleaning; absorbents and disinfectants used plentifully. Every day, as soon as the general cleaning up was over, men with whitewash and brushes came around to cover every stained and soiled spot in all the barn. When they were through, the whole establishment was as clean, as neat, as sweet and white as any kitchen. Every step in butter-making was made with painstaking exactness. The food was a ration compounded by a wisdom founded on a broad experience, supplemented by the highest scientific attainment; compounded to produce the greatest quantity of milk compatible with the highest quality. The butter was sold at a fancy price; as you may well imagine the income from that source was the reliance of that farm.

In the west, where beef and beef alone is the object of cattle-keeping, an active, strong, large, good feeder, an industrious forager, hardy to endure all seasons without shelter, giving milk enough to raise her calf to three months' old, is the farmer's ideal cow. One with a free flow of milk is a nuisance there.

The immortal J. N. used to reply, when asked an opinion on any political or philosophic question, "everything depends on your stand-point." In reply to the question, "what kind of a cow shall a farmer keep?" I know of no wiser answer than that of J. N. Free—"it depends on your stand-point."

As we stand midway between the cities by the sea and the cheap ranch lands and the free ranges of the west, though partaking somewhat of the conditions of both, yet unlike either, common sense suggests our cow, while differing, must unite some of the qualities of each extreme. With us, it is neither all butter, nor all milk (and not much *sugar*, by the way)! On our farms in southwestern Ohio we must have a breed of cattle capable of producing butter or beef in fair quantities, as needed.

There may be a deeper question for farmers in these valleys to consider, whether it is not wiser to make dairying a more important factor in our agriculture than we have hitherto done; if we ever do, our new necessities may require a new cow. These are not the questions before us at this hour. We all know about the requirements of our best farmers. How they can be best met is the query to day.

I know there is a general disposition to scoff the proposition of a general purpose cow; to deride the idea of a breed of cattle that may give profitable returns of both beef and butter. The great cry is for special purpose breeds. Every farmer present has known cows that were large milkers, good butter-makers, and at the same time of large frame, and whose male produce made splendid and profitable steers for the feeder and butcher. It is something of a misnomer to call the cow we have in mind a general purpose animal. She has a specific place to fill just as truly as those demanded by the fancy dairymen or the beef producers. We want a special cow for the general farmer; we want a cow to go upon the farms of the Miami valley, where a mixed husbandry prevails—where, from the necessity of the surroundings, the farmer cannot turn his attention exclusively to either milk or meat. We want her for this special and only purpose; we do not want her for the dairies of scanty herbage on New England hills, nor for the feeder on the lush grasses of the west.

Those who have no faith in the cow we suggest, beg the whole question by exclaiming, "why feed a twelve-hundred-pound cow for six years to get no more milk than you can get from one of eight hundred pounds?" Is it true, all other things being equal, that the average is in favor of the little one? The scorn put upon the idea of an animal having the dual functions of butter and beef is not well placed; they are necessarily found combined in some degree in every cow; none so small or lean and exclusively milk-producing but that some beef lines their bones; no cow so prone to meat but that some secretion of milk follows maternity. We

want more beef than a fancy butter-maker needs—more milk than a ranch man cares for.

The farmer's cow is a machine to convert the coarser products of the land into something of higher value and smaller bulk; to turn the straw, hay, corn, oats, flaxseed, etc., into the more compact and valuable form of milk, butter, cheese, and meat. It is fairly reasonable to suppose that a large cow can do more of this work with less bodily strain than a small one. Our standard authorities, as Allen in America and Youatt in England, writing with no theories to bolster, concede this to be true. In the absence of ascertained facts we may reason by comparison and analogy. This is plain; the cow does not create anything, she only changes things; the milk and meat she gives us must be from the food she consumes, always somewhat in proportion to her digestive capacity. Milk and meat are almost identical in their elements; both come from the blood; the process called secretion may just as correctly be called separation; separating in the mammary glands it is milk; separating in the cells of the tissues through which the blood is flowing it serves to build them up and we have flesh. In mechanics it is known that within certain limits a large boiler or large engine will do a great amount of work more cheaply than a small one. Every manufacturer knows that it is more economical to have boilers rather above than just equal to the estimated requirements of his machinery. Every fireman will say that a boiler that is constantly on a strain, is frequently calling for repairs and is short-lived. You may heat a large room on a cold wintry day with a small stove, by constant firing; every housekeeper knows it can be done with less fuel in a larger heater. May we not draw the obvious conclusion in this matter, that the larger cows will be able from a given amount of food to produce an equal quantity of milk with less strain on the vital powers, and with better promise of many years of usefulness? I shall act up to this conclusion and keep fairly large cows; indicative of roomy stomachs, full digestion, strong nerve centers, and ample supply of blood from which to draw milk or meat. Satisfactory public tests we have not had; we have no reliable expert proof, but we have some facts in favor of the cow I have been outlining, which lawyers will agree is a good kind of testimony, and these are the dairy contests of England, and general repute of certain strains in Europe. The Short Horn cows, the Ayrshires, the Red Polls and Devons all have high standing as milk breeds as well as meat makers. At the annual shows the Short Horns have beaten all rivals for butter and milk, and stand in the first rank as dairy cattle.* Holland has a wide renown for

* The British dairy farmers' association has been making an official test of dairy cows at the London dairy show, annually, for eight or ten years. There have been from thirty to fifty cows entered each year, representing all the prominent breeds. Prizes are given for the best of each breed; but the champion cow of the show—the largest milker, quantity and quality considered—has always

superiority in butter and cheese; when Americans came to look up the cattle on which it was founded, they discovered the Holstein cow, and she is nobody's runt on the butchers' hooks. Passing the Netherlands, further up the Rhine, there is a notable milking family in the large-framed belted cattle of the Swiss. Every farmer has owned or known cows of the Short Horn type that have been extra at the pail. England's farmers have needed, have sought, and found a combined cow, producing both milk and meat, as alternately needed, and they have her mainly in the Short Horn. That or a similar cow is "The Farmer's Cow" for us, as I believe. What is the list from which to choose? Short Horns of milking families, Holsteins, Red Polls, Ayrshires and Devons. Fuller knowledge may amend and change this somewhat. How shall farmers get them? Two ways: direct purchase of herd book animals of both sexes; this is the quickest but most costly way; another way, practically and intensely interesting, within the reach of all is: First, determinè which breed you prefer, then by selection from native cows as near the type as possible, and the purchase of a pure-breed bull. I have no time to talk of pedigrees, but I want to say this much, get a pedigreed male—never in any stage of your breeding use any other—but see to it individually that he "fills the bill," and see to it that his ancestry have been noted for generations to have had the qualities and traits you most desire in his progeny, then save the female calves most nearly like your ideal, and thus your efforts will be cumulative, and in a few years you can expect marked results.

I want to impress on every man, especially every young man, that he can do a great deal for himself as a breeder, and every farmer breeds more or less. Darwin says "the power of this principle of selection is not imaginary. It is certain that several of our eminent breeders, even within a single lifetime, modified to a large extent their cattle and sheep." Youatt refers to man's powers in selection as, "that which enables the agriculturist not only to modify his flock but to change it altogether. It is the magician's wand, by means of which he may summon into life whatever form and mould he pleases."

In conclusion I must say the farmer's cow should be hornless. Cattle, sheep, hogs, and horses are kept in few or greater numbers on all farms; we are often compelled to turn them all into the same enclosure; comfort, safety, economy of space demands that no horns be allowed to

been an unregistered Short Horn, except two years, when the position was won by an Ayrshire. Every year, however, without an exception, the best Short Horn has far excelled in yield of milk and butter the best Jersey, Guernsey, or Holstein. At the test last summer, allowing one point for every pound of milk, twenty points for every pound of butter fat, four points for every pound of other solids, and one point for every ten days since calving, after the first twenty, the best dairy Short Horn scored 186 points, second best, 135.9; the best Jersey scored 97.3 points, second, 88.3; best Guernsey, 101.8; second, 89. At the show in 1887, with the same scale, the best Short Horn scored 127.1 points; the best Jersey, 91; the best Guernsey, 80.2. [J. McLain Smith, in *Ohio Farmer*.]

enter. We all concede, readily understand the use, the necessity of this deadly weapon to the wild cow; necessary for defense against the attacks of other wild and ferocious animals; necessary on the heads of the males that the strongest and fittest should survive, as is nature's plan. In domestication the conditions are all changed; man stands between his cattle and all their former foes; his judgment and will decides which shall survive. The use for the horn has passed away, the horn itself should go; it is going; it is an ugly, cruel, murderous spear; in all the walks of civil husbandry it should be laid aside.

For many years I have spent time and money in experimental breeding to dehorn two of our breeds of cattle (or rather to produce a few cattle of two breeds without horns). The road, as you may imagine, has been long, tortuous, and often quite gloomily dark, but I think I am nearing some brighter days. Others have been at the same work, and several have achieved more marked results than I can show. I am an advocate for hornlessness for all domestic animals. This is a fertile theme with me. I do not care to go further into it to-day.

LECTURE BY W. H. SUNDERLAND

BEFORE THE OXFORD FARMERS' INSTITUTE.

When I was a boy I entertained a most profound impression of the wisdom of a professor in a literary college. Indeed, I thought he must know everything; that he was the very embodiment of wisdom.

At the age of eighteen years I was sent to one of these literary institutions. It had a president, a man of large proportions and of great dignity. He looked very scholarly, and he was surrounded by several of these professors.

It chanced one Saturday, soon after my admission to the school, that I was favored with an invitation to accompany a fellow-student and two of these dignitaries, these professors, on a stroll into the country, where it was proposed to have a game of ball.

On the way they engaged in conversation with each other very learnedly. They talked about things in nature; on things of the earth, above and beneath it. I listened in amazement. I was now more fully convinced than ever that my impressions on their very superior knowledge were well founded, when suddenly we came upon a flock of sheep feeding in a pasture.

Professor D——, stopping, turned to me and said: "Sunderland, how often do they shear sheep?" You can better imagine my look of astonish-

ment than I can describe it, as I turned to observe that he really had asked for information. He did not know how often sheep were sheared, but I did, although a "green country boy" and fresh from the farm.

It dawned upon me for the first time that a college professor did not know everything. It was one of the best lessons of my life. It has helped me in many ways, and in this especially: When asked to present something that I have learned from experience and daily observation (while I know that my auditors may know much more than I do about many things and a great deal about my specialty), concerning it, I may speak with an assurance akin to almost absolute certainty. And now, without further apology for my appearance before you on this occasion, and begging your indulgence for a little time, I will speak to you on the topic assigned to me, viz.: "Practical Butter-Making," and in the first place, as to the profitableness of butter-making let us make some inquiries. Will it pay? This is the practical part which first suggests itself to us. In a general way I may say there are hindrances to it, as to almost everything we farmers undertake to do. Butter-making is subjected to the same sharp competition as almost all other manufacturing industries, and perhaps to the additional one, that of being one of the staple articles of food, one in constant use by almost every one; it becomes like muslins and calicoes to the dry goods man, or sugars and coffees to the grocery man; the margins are of necessity small. The money must be made in the amount produced. It costs the creamery men the same, or very nearly the same, to produce 100 pounds of butter as it does 1,000 pounds. If the profit on 100 pounds is \$2.00 a corresponding profit on 1,000 pounds would be \$20.00 or thereabouts.

This suggests the desirability of co-operation, or a division of labor. Let the farmer produce the cream and furnish it to the factory man, who can make it up and find a market for the product. He can do this much better than each one of his 200 or 300 patrons can do it, thus giving to patrons of the creamery all the more time to devote to the production of cream. Do in this as in other things. The farmer would not think of grinding his corn and wheat and finding a market for the flour. He leaves this to the miller, whose business it is, and who knows how to do it. The farmer no longer undertakes to break his flax and spin his wool and weave them into garments for his wearing apparel; he delegates this to more skillful hands, and contents himself to produce the raw material. This is not only more practical, but more profitable in the long run.

If the farmer fixed for it can keep ten cows at a profit, with slightly increased facilities and a very little additional labor, he can keep twenty cows, or even more than that, at a much greater profit. It used to be thought that *two acres* of pasturage was necessary for one cow, and that

was so under the old method, but now two cows to the acre can be kept equally well and much more profitably. The Hon. Hiram Smith, of Sheboygan county, Wis., is keeping 100 cows on 100 acres, and producing on it all they subsist on, and profitably, too.

This is done by soiling. Keep the cows up the year round, only allowing them to go out mornings and evenings for water and a little exercise, when the weather is pleasant.

A gentleman told me recently he found by experiment a shrinkage of ten per cent. in the amount of milk his cows gave by turning them out of the barn to the water-trough to drink in the winter season. He now provides water slightly warmed in the stable for his cows, and keeps them in from November 1st to April 1st.

A great deal is said about a well-balanced ration for a milch cow. We are told it must contain a sufficient amount of albumenoids, the carbohydrates and protein, etc., and so on, all of which to the scientific mind seems rational and explainable, and is, no doubt, all right, but to the average farmer these things are difficult to understand. He is not and cannot become a chemist and make an analysis of foods; he must content himself with experiments in feeding and note results.

I have found in my own experience that the Mangel-Wurtzel or Cow Beet is a most excellent milk and butter producer. Commencing to feed these beets December 1, 1887, when my cream was testing eighty per cent., I was surprised to find in four weeks it tested 120 per cent. Then leaving off the beets for four weeks it gradually fell to eighty-five per cent., then upon resuming them again for three weeks it ran up to 110 per cent., when the beets gave out. Then returning to the usual amount of dry feed, it soon declined to the same per cent. shown by the record previous to the time of beginning the beet ration.

I raised about 300 bushels of these beets this last summer. We fed them with most excellent results during the dry season in the after part of summer and fall. Properly planted in good soil and cared for, they will produce from 600 to 1,000 bushels to the acre. Cut them up and feed them like pumpkins, and in about the same quantity with other feed.

The best, and perhaps the cheapest, and in every way the most convenient feed for milk cows, growing young stock or steers, is ensilage. It may be fed to fowls and hogs also.

Ensilage is anything green preserved in the silo. The best silage is made of green corn past the roasting-ear stage. A southern corn is used, growing large stocks with dense foliage, often producing thirty to forty tons to the acre.

At Alton, Ills., a dairyman is reported as having fed 110 tons of ensilage in 1888, the expense for which (including cost of silo, growing, fill-

ing, etc.,) was sixty-five cents per ton, on which he fed twenty-five cows for six months. It was grown on less than nine acres of ground, the cost per cow being less than \$4.50 for the six months, or seventy-five cents per month.

The State Dairy Commissioner of New York says last year the gross receipts of his cows were \$93 each, and the net profit \$56 each. He could not feed ensilage, else his net profits per cow would have been more nearly in proportion to gross receipts. He thinks, however, he could profitably produce butter at sixteen cents per pound.

A gentleman in Shoreham, Vt., says that after a number of years' experience in feeding cotton-seed meal to cows, he continues to use it. His cows have been very healthy. He has had but one case of abortion in more than fifteen years in a herd of thirty-five, and only one case of milk fever. His production of butter ran as high as 325 pounds per cow in 1885, and 310 pounds in 1886, without grain in the summer. He feeds two quarts of cotton-seed meal per day, or with corn, or corn and oatmeal, equal parts, four quarts per day at two feeds, with plenty of good hay and pure water.

Cotton-seed meal is shown by chemical analysis to stand first among foods in the amount of protein it contains; oil-cake meal is second, and wheat bran third. Protein is a very necessary element in the formation of milk, but too large a proportion of either cotton-seed meal or oil-cake meal makes a poor quality of butter.

Prickly cornfrey has been successfully grown and fed to milching cows by Dr. Henry, of Clifton Springs, N. Y. He has been using it for five years, and holds it in very high esteem. He cuts a fifth crop in one season. To secure this enormous yield he thoroughly cultivates and top dresses it between each cutting. He says they have no forage plant that compares with it in producing quantity and quality of milk.

The dairy interests of the country have assumed vast proportions. It is stated upon good authority that from fifteen to twenty millions of cows are in use to supply milk and its products—butter and cheese—in the United States; that there is invested in cows and apparatus for dairying purposes over two billions of dollars, an amount largely in excess of the banking capital of the country. The number of men employed exceed seven hundred thousand, and the feed consumed runs into the hundreds of millions of bushels annually.

Of the consumption of butter, it is estimated that of our population of fifty millions of people, ten millions consume one pound per week, or ten million pounds; ten millions consume three-fourths pound per week, or seven million five hundred thousand pounds; ten millions consume one-half pound per week, or five million pounds; ten millions consume

one-fourth pound, or two million five hundred thousand pounds; ten millions consume none at all, either because they do not like it, or most likely because they cannot afford it.

Now, add to these twenty-five million pounds of home consumption, our exports of two hundred million pounds, and you get some idea of the magnitude of this business.

Ohio had, by the agricultural report of 1885, the latest I had access to, 595,524 cows, valued at \$20 apiece, would make \$11,910,480. There was made during the same year 48,376,698 pounds of butter, valued at 14 cents per pound, would make \$6,772,737.72; sold at an estimated loss of 10 cents per pound, because of the poor handling of the cream, would be \$4,837,659.80.

To make good butter it is as essential to have good cream and then to handle it properly. It should be made from the milk of well fed cows, and it should be thoroughly stirred in the cream jar at least once a day—twice or three times would be better. In this way it would be aerated or oxygenized, and oxygen in the air coming in contact with the essential oils composing the butter fat in the cream, conduces to high flavored butter so generally sought for and difficult to find in the winter time.

I believe that if in ripening the cream some artificial means could be devised to incorporate oxygen gas with cream the butter would possess a higher flavor and a richer, nuttier taste. The absence of these very essential qualities is more noticeable in dark, cloudy and warm weather, such as we have been having recently.

But now, to go back a little, milk, to secure good cream, should be set in water-sealed cans as quickly as possible after it has been drawn from the cow, and while it still contains the animal heat. The water should be prepared and made ready to receive the milk before the milking is begun, either by ice or otherwise, the colder the better. Milk contains fibrin. The same principle is found in the blood; sufficient cold prevents it from clotting and adhering to the side of the milk can, thus inducing a more perfect creaming. Professor Babcock says that milk left out of the water ten minutes loses 7 per cent. of the cream; if left out half an hour, 20 per cent. of the cream. He found this to be so by actual experiment. I recommend warming the milk to 80 or 90, or even 100 degrees upon the stove, if for any reason it cannot be strained into the milk-cans and placed in the water immediately after it is drawn from the cow. Milk is an emulsion. The butter globules are distributed all through it; being oily in character they retain the heat much longer, are much lighter, and rise quickly to the surface, as the water in the milk takes on the temperature of the water in which the milk-can is set.

The skimming should be done daily. The cream may be kept in a

stone jar provided for the purpose, well covered, and should be placed in the water. I always prefer to keep cream in a milk-can and submerge it in water.

The churning should take place as often as twice a week in winter, and every day in the summer time. Cream must be ripened before churning. This consists of warming it to a temperature of from 60° to 70° and holding it so from eight to ten hours; meanwhile it should be stirred well occasionally, for reasons above mentioned. When cream is ripe and ready to churn it will present the appearance of buckwheat batter after stirring very thoroughly and coming to a rest. I mean so far as the surface is concerned, in the beads that will arise and settle upon it. It will have a slightly acid smell. It is then said to be in the first acid or sugar state. Cream may be old and sour, very thick, and yet not ripe and in the right state for churning; this is the reason people sometimes churn one and two hours on a small quantity of cream. Cream should be from 58° to 60° in summer, and from 62° to 64° in winter, for churning, and should always be regulated with a thermometer

Good cream is smooth and oily in appearance, not lumpy and thick. It should pour like molasses, having a thread-like appearance, the particles adhering one to another and refusing to separate. It will be semi-apparent if looked at in a clear light. The setting of the milk and preparation of the cream having had careful attention, we are now prepared to describe the process of churning. This consists in a violent agitation of the cream so as to separate the oil of the cream from the casein and water; the process completed gives us the butter and the butter-milk. It matters little how this is effected so that the granules of the butter are preserved. The original method was the very novel one of sewing up the skins of wild beasts, enclosing the cream, attaching this by means of ropes to the saddle, then dragging it over the rough ground at a brisk gallop until the churning was completed. We are told the same thing may be accomplished by burying the cream under the ground for twelve or fifteen days. These were very crude methods practiced by the Aborigines of this country. In modern times churns and washing machines in endless numbers and varieties have been patented. Among the latest is the Cyclone churn, said to bring butter from skimmed milk in the space of two minutes.

One of the requisites to good butter is absolute cleanliness. All vessels should be thoroughly scalded and steamed out at least once a day. Any neglect in this particular will soon be discovered in the flavor of the butter. A churn having dashes or paddles should never be used. The process of slushing or concussion is the only true method of churning. Butter, when forming, appears first in granules or globules, which assume the size of large wheat grains when the work is completed. The larger

and more perfect the granules the better, but care should be taken to stop the churn at the right turn, or these will adhere to one another. I have found a marked difference in these granules between the common and the Jersey cow, those of the Jersey being larger and more symmetrical. Jersey butter is waxier, firmer, tougher in texture, and sweeter than that made from the common cow.

The aroma, or flavor of butter, is contained in these granules. If they are beaten and broken by dashes or paddles in the churn the aroma or sweetness is diffused through the butter-milk and lost.

As soon as the churning is completed the milk should be drawn off and clear, cold water, containing a small quantity of salt, should be thrown into the churn. Let the butter granules float in the weak brine for at least a half hour; two hours in warm weather would be better. The salt cuts the casein or cheesy covering of the granules and dissolves it. It also serves to glaze over and harden them. When this brine water is drawn off, fresh water is added in large quantity; this in turn, after agitating the churn, is drawn off, and the process is repeated until the washings are perfectly clear. After dripping sufficiently, the butter is ready to gather. This is done by a quick motion of the churn, after which it is taken out, weighed and placed upon the butter-worker.

The working, after salting, consists of light pressing or rolling so as to mass the granules together, and at the same time to press out the brine water formed by the melting of the salt. In no case should the butter be beaten or paddled, as this will destroy the grain and render it a greasy, lifeless lump. Two workings from two to six hours apart are necessary. When the working is completed it is ready to put into prints, tubs, or firkins, and to be shipped to the market.

If the cream was fresh to begin with, and handled as above described, the butter made will conform to the following conditions:

The flavor will be quick, full, fine, and fresh; the taste will be pleasant and sweet, lingering for quite awhile in the mouth; the brine will be perfectly clear and little in quantity, appearing dew-like upon the tryer; the body and grain of the butter will be perfect, the color even and uniform; the salt will be evenly distributed—in short, it will be “gilt-edged,” and will command the highest price and give entire satisfaction in any market in the world.

THE FARMER'S ORCHARD.

It is one of my particular hobbies that a farm is not complete without an apple orchard. When I ride about the country and see a farm

(and I see lots of such) with no bearing apple-trees growing near the house, nor on the farm, the first thought that comes to me is, "that family have to live on pork and potatoes the year round. I wouldn't like to be a boy growing up there; I wouldn't want to be the cook and have to prepare the family meals without fruit; I don't believe it would be a good place to board."

To my mind, an orchard is an *ornament* to a farm. It is a shady grove, with all the poetic associations and suggestions of any other grove, however romantic it may be. An orchard is a *fruit-bearing* grove; and a more poetic sight could not be witnessed than to see children playing with a swing under the shady apple-tree, and stopping to pick up the ripe fruit their childish sport has shaken down. What memories cluster about the old orchard at home! An orchard not only adds beauty to a farm; it adds a charm and a home-feeling that nothing else can.

How an enterprising Ohio farmer, how a *Miami county* farmer, can live along and compel his wife and children to live from year to year without these blessings, when, with a little effort, he might easily procure them, is a conundrum I never could guess.

To have an orchard, and a good one, requires the understanding of a very few simple points: First, where to plant it. Second, how to prepare the ground and set the trees. Third, the after care and culture. Fourth, the selection of varieties. I will treat the points in the order named, believing a man should not order his trees until he knows what to do with them.

Where, then, shall we put the orchard? Near the house, to be sure, or as near as suitable ground can be found. It should be near by as a shade, a grove, a protection to the house, a background to the picture. It should be handy for the women-folks to get apples themselves, and not compel the tired men to run half a mile to get a few for dinner. It should be near at hand, so the boys and the hired man can get apples to eat without much trouble and waste of time.

But the orchard should not be set in a little cramped lot. The orchard-plot should be long in proportion to its width, so that in plowing there will be few rows to bother with and as little turning at the ends as possible. There are cases in this county, I verily believe, where family rows have been engendered by orchards that were put in little square lots and the end trees near the fence. The immediate occasion of the trouble has been the annual spring plowing. The horses *would* skin the trees with their trace-chains, and drag the harrow against them, and the plowman get mad, and the women-folks come out and remonstrate at his brawling so at the poor horses, and—and—

The result is, the trees, as if to "keep peace in the family," quietly die, one after another. This is a true picture, my friends, and I hold it up as a warning to you! Plant in long rows, and be sure to leave plenty of room at the ends for turning.

The third point, as to location is, that the ground be capable of good drainage. When an apple-tree is compelled to stand with its feet in water a good part of the year, it invariably gets a bad cold and dies before reaching the years of usefulness. On the other hand, your tree should not be set on a gravelly knoll or hillside. It don't want its feet hot and dry all summer, but comfortably cool. Let me lay down the law, right here, that must govern every part of your work in planting and caring for your orchard; it is three words, "Use common sense."

Let us use common sense in preparing the ground after it has been selected. We want our trees to grow, every one of them, and to grow vigorously, and in due time bear us lots of choice fruit. From the limited space, 28 or 30 feet square, in which the tree stands, it must draw all the materials for its growth—all the sugars, acids, juices, and mysterious compounds out of which the fruit is made. A little thought will convince us that it will be wise to keep the soil in as good condition as possible, as to fineness and moisture, so that the roots may penetrate every part of it in search of food for the tree, and find the food in the soil in proper condition to be taken up. A little thought will convince us that weeds and grass, and crops of grain or vegetables must not be allowed to appropriate that food. If we grow such crops in the orchard, the substances they take from the soil must be returned in the shape of manure. We learn especially that it will be ruinous to the trees to let the orchard lie in tough, blue grass sod, and then turn cattle in to tramp the ground hard over the millions of feeding root-mouths of the trees. Observation, as well as theory, convinces us that an apple-tree does best and bears the largest and nicest fruit when it is well-fed and well cultivated.

But I started to speak of preparing the ground before the trees are planted. To show you what high authority thinks on this subject, I will quote from an essay read before the Ohio State Agricultural Society in 1885, by H. G. Tryon, now President of the Society. He said:

"Always prepare the ground with the best of tillage before planting. Turf should be well on the road to decay, and the sub-soil, if compact, should be loosened, as deeply as possible over the entire ground, and fully as deep as the roots of the tree when planted. Under the tree the sub-soil should be thrown out, and to one side to the depth of two feet, and replaced with surface-soil by cutting down the sides of the excavation. For an apple-tree, this excavation should be not less than four or five feet in diameter. If the soil is two feet deep under and about the tree, and the

entire surface made loose to the depth of ten, twelve, fourteen, or sixteen inches, according to the soil and means one may be able to employ, the tree will neither be drowned out nor dried out." "*Depth of tillage,*" he adds in italics, "*affords of itself fertility, drainage and moisture.*"

I have never done as thorough work as that in setting an orchard, nor ever seen it done, not even with a single tree, but I have no doubt it would pay. The best plan I have ever *seen* practiced was to prepare the ground as for a crop of potatoes, and marking off with a regular marking-sled both ways. We did it that way last spring, and set the trees in every eighth row.

Before planting, all broken ends of roots were cut off smooth, so as to facilitate healing; then the roots were puddled in thin mud. The trees were set a little deeper than they stood in the nursery, the dirt being made fine and worked in well among the roots. Before the hole was full, the dirt was tramped down tight on the roots, the top being left loose as a mulch. Father attended to the trees after they were set, and he hoed them frequently all summer. The leaf-rollers began to make themselves houses in the leaves, soon after they put forth, and you may be sure the watchful cultivator made short work with the intruders. It will be remembered that the early part of the season was dry; father says a number of the trees would have died if he had not kept the ground well-stirred about them. This in addition to the careful cultivating given the potatoes, in which the ground was planted. I know an orchard planted last spring and the ground sowed to oats. This crop kept the owner away from his trees, and the result is that several died before the end of the summer, and few, if any, made a good growth.

The orchard should be kept in hoed crops for the first eight or ten years, and then seeded down to clover and used as a hog-pasture, for a change. Every fall, for a few years, we will bank the dirt up around our trees, and hoe it away again in the spring. The pruning-knife and saw will be used to keep the top balanced, and to train them into symmetrical shape; also to thin them if the tops become too thick.

It remains to talk a little about varieties. A great many people put off this part of the business to the time when the enterprising tree-agent comes along. They are dreaming of the perfect variety of the future, hardy as a pine-knot, bearing loads of apples every year as big as a sugar-bowl and sweeter than honey and the honey-comb—and they fondly hope that the agent may be able to help them out. And he does—of their cash! Who of us has not been taken in and done for by—by these men who were smart enough to cater to our own foolishness. We didn't want the old, well-established varieties, but something new—and they supply the demand.

"Come, now, let us reason together:" To my mind, we should always keep in view the fact that we will want to sell our surplus fruit. This should lead us to plant the most trees of those varieties that are known to do well in our locality and to sell best in market. When people in town learn that a certain variety is good, that it not only looks well, but is good for sauce or pies, or some other favorite dish, they will be sure to call for it. The wise planter will remember this. If he does not know which are the best varieties for the market, he will consult the leading grocers in his vicinity as to what varieties are the most popular with the ladies; he will also ask who bring the nicest and best apples to market, and he will go to these growers and "ask them forty questions" about varieties, modes of culture, and so forth. Learn all you can; you will realize the need of all the knowledge ten men possess, before your orchard is five years old.

I will give you the list of varieties I would plant, and the number of each in an orchard of forty trees—and if you don't want to plant them, you don't have to: 2 Red Astrachan, 2 Summer Queen, 1 Sweet Bough, 2 Maiden's Blush, 2 Colvert, 10 Grimes' Golden, 5 Smith Cider, 3 Talman Sweet, 6 White Pippin, and 7 Indiana Favorite, Milkler, or Rome Beauty. Total, 10 varieties, and 40 trees. These are enough; they comprise nearly all the desirable qualities in apples, and furnish a supply the year round; and the trees are hardy and productive.

When your ground is ready to plant, hook up to the big wagon, fill the bed nearly full of damp straw, and drive to the nearest nursery and get your trees. Don't take trees that are dug and heeled in, but have them dug from the nursery rows, and select nice, straight trees yourself. Take a bushel-basket along, with plenty of damp straw in it, and into this basket set each tree as fast as dug, packing the roots well with the straw. When the basket is full enough for carrying, take the trees to the wagon and lay them in, covering tops and roots well with wet straw. This may seem like foolishness, and will be ridiculed by the nurseryman and his men, but never mind; this extra care don't cost much, and it will be found to pay big.

So in preparing the ground and planting, in cultivating, and in handling the fruit, it will pay to exercise care. An orchard costs money; it takes land and valuable time, and if it is to pay, the work must be well done from first to last. The farmer who wishes to have a nice, profitable orchard must give the subject thought. He must read; he must take time to visit the best orchards in his county and learn how they are managed. He must take a real interest in his trees, study their wants and provide for them and protect them. He who will not do this is not worthy of the rich blessings a good orchard affords.

W. L. PERRY.

AMERICAN FORESTS—THEIR DESTRUCTION AND THE EVIDENT RESULTS.

[Paper read by John L. Shawver, before the Logan County Annual Institute, Jan. 1, 1889.]

A knowledge of the fact that 240,000,000,000 feet of lumber are required for annual consumption in this country, is sufficient to arouse in the minds of thoughtful men an interest in forest destruction and the results. Adding to this the fact that, on an average, 10,000,000 acres of forest lands are burned over every year by fires, kindled intentionally and unintentionally, and the question becomes more serious.

Should forest fires be prevented, the present demand on forests for timber supply would require that 400,000,000 acres should be kept perpetually in well-stocked forests to give us the necessary supply; and when we realize that there are only 489,200,000 acres of forest area in the United States, it would seem evident that the surplus forests will not furnish so great a burden for the mind of the average politician as the surplus in the treasury.

With increasing population, the demands on forests for timber supply will also increase, and hence it appears that the time has arrived when some effort should be made to stop, or, at least, to restrict, the wholesale destruction of forests that has prevailed during the first century of our national life.

Originally, the greater portion of the territory east of the Mississippi river was in forest, and when the pioneer went forth in search of a new abode, well might he say with Longfellow:

"This is the forest primeval—
The murmuring pines and the hemlocks,
The foliage sparkling with dew-drops."

To-day he would say:

"Look now abroad—another race has filled
These populous borders; wide the wood recedes,
And towns shoot up, and barren realms are tilled
Where once were seen full harvests and green meads."

Of the total forest area, 71,000,000 acres are under control of the Government, and 190,000,000 in the control of farmers, leaving 228,000,000 in the hands of corporations, lumbermen, mill-owners and speculators. Scientists estimate that agricultural regions should have from 25 to 33½ per cent. of their areas in forests, and the lowest assignable point has

already been reached by this country. Western Europe, modified by ocean currents and prevailing winds, has more fogs, rainfall, and a milder climate, with a small per cent. of forest, than we do with 25 per cent. of our area in forests. Some of the States have passed the minimum point long ago, and are reaping the results in destructive blizzards, spring freshets, summer droughts, dry wells and ruined crops.

Massachusetts (19), Connecticut (21), Pennsylvania (24), Delaware (23), Ohio (17), Indiana (19), and Illinois (9), have less than 25 per cent. of their areas in forest, while none of the States west of the Mississippi, excepting Minnesota (59), Arkansas (58), Oregon (33), and Washington (44), have ever possessed the requisite proportion. They range from 2.8 per cent. in Nevada, to 20 per cent. in California.

Ohio, with 14,000,000 acres of forests in 1853, has to-day little more than 4,000,000, or 16 per cent. of its area. In the Miami Valley, 67 per cent. of the forests was destroyed, from 1853 to 1883. In the Hocking Valley it was even worse, for there, 73 per cent. of the forests was destroyed in the same period of thirty years. But the Miami Valley has less forest area to the population than any other of the seven natural divisions of the State; having but $\frac{5}{8}$ of an acre to each inhabitant.

The following table shows the amount of timber land in each county in the Miami Valley in 1853, and the per cent. destroyed in thirty years, up to 1883. (The figures in parenthesis show the per cent. of forest area in 1883):

	Per Cent.
Champaign (23), 112,143 acres, destroyed	45
Preble (19), 121,619 acres, destroyed.....	58
Logan (19), 142,139 acres, destroyed.....	61
Montgomery (13), 104,056 acres, destroyed.....	61
Warren (13), 100,903 acres, destroyed.....	67
Greene (14), 116,568 acres, destroyed.....	68
Clinton (15), 125,088 acres, destroyed.....	69
Shelby (21), 180,220 acres, destroyed	69
Darke (21), 256,200 acres, destroyed.....	70
Clarke (11), 98,813 acres, destroyed.....	71
Brown (15), 189,719 acres, destroyed.....	71
Miami (13), 120,822 acres, destroyed	72
Butler (9), 100,671 acres, destroyed.....	73
Clermont (11), 141,488 acres, destroyed.....	76
Hamilton (5), 88,123 acres, destroyed.....	87

No county in the Miami Valley has more than 24 per cent. of its area in forest. Twelve have less than 20 per cent. Eight have less than 15 per cent., and two have less than 10 per cent.

LOGAN COUNTY FIGURES—IN WOODLAND.

	Per Cent.
In 1853 of the whole area of Co	50.50
In 1870 of the whole area of Co	49.95
In 1875 of the whole area of Co	38.60
In 1880 of the whole area of Co	26.55
In 1883 of the whole area of Co	19.51
In 1885 of the whole area of Co	17.78
In 1888 of the whole area of Co., about.....	14.00

We thus see that Logan county has 44 per cent. less timber lands than she should have to reach the standard of agricultural conditions; a reduction of 65 per cent. in 35 years.

But what are the causes that have led to the present forestal conditions? Among the causes, is that of clearing for agricultural purposes, oftentimes felling the trees and burning them on the ground, or cutting out the best and burning the remainder, the chief object being to get rid of the timber and fit the land for cultivation. The item of fences, especially when farms are laid off in six or eight-acre fields, and fenced with ordinary rail fences, is one of importance in timber consumption, and foots up to 6,000,000,000 feet annually. 30,000,000,000 feet are required yearly for building and manufacturing purposes. Railroad construction calls for 4,400,000,000 feet. The charcoal furnaces use 3,000,000,000 feet. 210,000,000,000 feet are consumed in heating our homes, cooking our food, and furnishing power for the various factories. On an average, 10,000,000 acres are burnt over every year, by which a large amount of timber is killed or made useless, and, what is worse, the young growth is destroyed, and the capacity of the soil for tree growth is diminished by the destruction of the leaf-mold.

Having briefly considered the conditions and the causes which led to these results, let us now consider the effects. The forest is the great reservoir of agricultural lands; the moss, leaf-mold and decayed wood acting as a sponge, absorbing all the rain or snow which reaches them, and gradually giving up to the soil and to evaporation during the heated season when they are most needed by the growing crops. Much of the water and melting snow penetrates the forest soil to the impenetrable sub-soil, where the water accumulates and reappears elsewhere as springs. Under the forest cover the melting of snow is retarded, and thus the flow of streams is more gradual and continued through a longer season, and lessening the tendencies to flood and devastation. Forests are the natural wind-breaks that arrest the force of the winds by retarding their velocity and modifying the climate by protecting us from frequent extremes of heat and cold; the air of forests being less disturbed by outer currents, its

temperature is higher than the cold blasts of winter, and lower than the parching winds of summer.

On the other hand, deforestation has a tendency to aggravate extremes of temperature as well as soil, lowers the average moisture of the air and diminishes the amount of precipitation; for the cool, moist air of forests in summer promotes condensation of the lower layers of clouds and the condensable strata of the air, and though forests may not actually cause rain, they at least provide favorable conditions and do not prevent rain as the heated, bare ground or field frequently does. Surrounding neighborhoods lose their protection from dry and cold winds, the force of which is unbroken, and unless protected by hills or mountains, are as liable to the destroying influence of the blizzard as the wide and open plains of the west. After deforestation the soil is deprived of very much less water by the process of vegetation than before, while evaporation is augmented and accelerated, resulting in unfavorable influences on the humidity of the soil and on the size and continuity of springs. With the disappearance of the forest the retarding influence of soil-cover on the superficial flow of water ceases. This, in conjunction with the augmented evaporation from the surface and the artificial drainage of swamps and ponds, produces the unfavorable influence of deforestation on the flow of brooks and rivers, which gives rise to devastating floods, such as that of the Ohio river in 1883, when \$60,000,000 worth of property was destroyed. This river, draining as it does portions of fifteen States, during a general protracted precipitation with no forests, swamps or ponds to retard the waters, must receive the drainage from 220,000 square miles of territory. Who can wonder that it should become a roaring, foaming, surging, destructive flood of angry waters.

But we are confronted by a *condition* not a *theory*, and the question arises, "how can the destruction of forests be prevented?" First, by the government refusing to part from any more of its timber lands. They are not needed for settlement, and are principally more valuable for the timber on them than for agricultural purposes; they are likewise more valuable, by their position on mountain slopes and crests, for the purpose of preserving intact the head waters of mountain streams and regulating their flow, than for their lumber interests. Their retention and administration, under government control, is demanded by the best interests of the adjoining territories, as well as of the country at large, as affording an impetus to the momentous question of forestry. Then an interest in forest culture should be encouraged and accelerated by the establishment of national schools of forestry. It is a significant fact, that other nations are aware of our deplorable condition in regard to future forest supplies. The Government of Bavaria, two years ago, sent an expert forester to study

the timbers of the United States, who explained the purpose of his mission in these words: "In fifty years you will have to import your timber, and as you will probably have a preference for American kinds, we shall now begin to grow them, in order to be ready to send them to you at the proper time." It might also be added that in fifty years from now, at the present rate of forest depletion, we shall in all probability be compelled to import many articles of food. For that agricultural deterioration surely follows forest destruction is clearly attested by the experiences of some of the older nations of Europe and Asia. Palestine, Arabia, Sicily, Media, Persia, portions of Italy, France, Germany, and the Spanish Peninsula are notable examples of once well-wooded countries, now noted for aridity, and some of them as deserts. Most of the European nations now have schools of forestry under government direction. Our country, as a nation, has practically done nothing in the line of forestry, except the establishment of a bureau in connection with the Department of Agriculture. Nebraska has the credit of inventing, or at least inaugurating Arbor Day, a movement, which, if carried out, will ultimately become a holiday filled with loftier inspirations, and more holy devotion than any other now recognized.

I might not be able to convince a Logan county school boy that to plant a tree and dedicate it to Longfellow, Whittier, Bancroft, Webster or Abbott was more patriotic than to shoot fire-crackers on the 4th of July, but the day is coming when that thought will be intuitive in his nature.

A few weeks ago, as I stood in Eden Park, Cincinnati, and viewed the beautiful groves of evergreen and deciduous trees planted there by the children of the Cincinnati schools, one dedicated to poets, one to historians, another to statesmen, another to philosophers, another to eminent divines, and so on through the whole list, I could not but feel what a lofty inspiration, what a noble purpose, what pleasant associations, what patriotic emotions must be engendered and entertained in the hearts and minds of children by the institution of "Arbor Day."

But another means by which deforestation may be prevented, is by compelling each landowner to keep a certain per cent. of his lands in forest, and by discontinuing the tax on woodlands. Many farmers destroy their forests because they say they are unproductive and do not pay the tax. The objection is raised that much of the forest land is held by speculators who will not improve their lands. Very well, but the day is coming when a few more such unimproved tracts will be very desirable accessories to the adjoining farms, and the speculator will only be holding his land for the benefit of neighboring farmers.

The persons reporting Harrison and Zane townships to the Ohio State Forestry Association, say the tax on woodland should not be reduced,

but that deforestation produces drought, cold winters, violent freshets and destructive winds; and since many forests are destroyed because of the tax, we must infer that these gentlemen believe in taxing the farmers for the purpose of obtaining dry seasons, ruined crops and Dakota blizzards.

Shall the promised land of the west go the way of the promised land of the east? When Joshua led the marshaled hosts of Israel down into Palestine, it was a country of wonderful fertility, blessed with a delightful climate, and a land that flowed with milk and honey. Both ranges of the Lebanon with its spur mountains were then densely covered with forests, in which the famous cedar predominated, that stately tree, so masterly and poetically described by the Psalmist and the Prophets. Here for many long ages was the envied home of many millions of God's chosen people, dwelling there in the affluence and splendor of a more than a golden age, though possessing a territory less than our own beautiful Ohio. But the promised land throughout its length and breadth, from Dan to Beersheba and from the great sea back to the mountains of Moab, was cruelly and completely deforested by its Italian conquerors, and almost immediately it became a comparative desert, inhabited by paupers and bandits, and incapable of supporting the twentieth part of the population that lived there in the days of Solomon in the very smile of Heaven. The hills of Gallilee, once the richest of pastures, are now sterile knobs and barren slopes, and who is there among those present that can deny that our own beautiful hills and valleys are not so productive, one year with another, as they were a few years back.

The subject of forestry is too great in its importance to the future well-being of our country to be treated as it deserves in a short paper like the present. I have only sought to give a few figures, state a few facts, draw a few conclusions, and throw out a few hints, leaving the rest to your intelligent minds.

Now, if I have convinced a single person that my subject is worthy of serious consideration, I shall deem my efforts repaid.

THE FARMER AND POSTERITY.

BY W. A. ROUSH.

One of England's greatest philosophers of the present age, has well said, "No man fulfills his mission in this world, who does nothing for posterity." When we consider the lives of such men as Luther, Washington, Jefferson, Newton and others, and attempt to realize the blessings

they have conferred on posterity, we find that it is beyond human comprehension.

But coming down to the humbler walks of life, we claim that there is no other class of men that can exercise so great an influence for the good or harm of posterity, as the farmers. To be convinced of this, we have only to look around us and ascertain the producing capacity of farms, as compared with the productiveness of the same land thirty or forty years ago.

Stephen Powers, writing in the *Ohio Farmer*, says that he has one piece of land on his farm in Washington county, on which his grandfather could never raise over eight bushels of wheat per acre, in its virgin state. Yet Mr. Powers obtains from fifteen to twenty bushels per acre on the same field. Now this is a noble and beautiful example of good farming, through successive generations, of the same family. But, alas! of how few farms in each hundred will this prove true.

We venture the assertion that nearly half of the farms in the hilly portions of Ohio, and other States that we have seen, are deteriorating, both as to the chemical elements of fertility in the soil, and also as to the body of the soil itself. Who has not heard remarks something similar to the following:

"What! only seventy bushels, did you say? Wall, I declar! Wy, jist tuther day 'Squire Simpson telled me that the fust year that old man Hendrix had this yer field in wheat, arter he bought the farm, (that was along airly in the fifties), he thrashed 380 bushels off'n this yer same field. How seezins is changin'!"

But to resume: In conversation, some time ago, with a young farmer, he made the remark, concerning a certain field on his farm, that he had in corn, a very wet summer, that the rain had taken off more soil in that one season, than he could put back in five years. Said I to him, don't say "put back," for the fact is you can never put back the soil that is lost; true, you may, by means of manure and clover, cause that field again to produce as large a crop as it did that year, but the soil that is lost, is lost forever, so far as that field is concerned, and now lies strewn from here to the bottom of the Gulf. He at once assented to the correctness of the proposition.

There are thousands of farmers yet living, whose names will only be remembered to be despised and execrated, for the manner in which they have abused the trust that God has committed to their care, in the farms they own or cultivate.

I have frequently made the remark, about some farmers I am acquainted with, that they would surely die very hard and unhappy, if they thought that there was a tree left standing on their land, that was worth a

two-dollar bill, when they were called to leave this world. I have frequently noticed, that where a farmer still continues to sell timber, to get a few dollars occasionally, when his supply of timber has really reached the point where it ought to be carefully guarded; he generally does it to get money for some pitiful or contemptible purpose, when he might have made the money in some other way and let the timber stand.

While I write I am thinking of a farm that has lately changed hands, and the present owner is at great trouble and expense to get timber for buildings and repairs, and yet part of the timber went off that farm to pay whisky bills, card-table losses, and expenses connected with still more abominable sins.

In the planting and care of timber lies a grand opportunity to do something for posterity, and, possibly, to do something that might benefit the latter years of our own existence. Chestnut and yellow-locust are probably the best kinds to plant in light or worn soil for farm use, and black walnut and poplar for rich, rough land. A great writer, some two centuries ago, said that "each generation owed a debt to its ancestry, that it could only pay to posterity, and one of the ways of paying that debt was by the planting and care of timber."

A man in Missouri, some thirty years ago, planted a piece of very rich land in black walnut, and lately sold the timber standing on the ground for over \$1,000 per acre. Yet, no doubt, if this timber had been let stand, its increase in value would have been ten per cent. or more, on the above price, for many years to come.

Again, as it is almost impossible to prevent a certain amount of loss of soil, by the washing rains of summer, we can, at least, stop a portion of this, in low grounds and small water-courses, by building stone walls across them, and placing straw, or anything that will act as a filter, on the upper side, to arrest a portion of the soil that otherwise would take its final leave. If this were a common practice on our farms, some future generation would haul it back, and be able to take better care that it did not escape again, than we can do under the present circumstances.

A good farmer, in our estimation, is not merely the man who makes the most money in a year, nor yet alone he who has the finest buildings and stock, but rather he, who, in addition to reasonable aspirations in the above objects, guards his soil with the most jealous care, who grieves to see even a handful of it wash away, and who hesitates to plow a field unless he can put more elements of fertility on it, in the shape of manure, than will be removed by the crop.

One of the noblest elements in a farmer's ambition should be the desire, that if he lived to be old—too old to labor himself—to see his well-

trained and progressive sons reaping double or treble as large crops per acre as he obtained when he first cultivated the same fields.

How many of us to-day are having enjoyment and profit from orchards that were planted by hands that are now stilled forever? Is it not our duty, even if we are old, to do as much for the generation that is to succeed us, as the past generation has done for us?

The following circumstance, which is from real life, shows the selfishness and short-sightedness of many farmers:

A farmer, about fifty years of age, was urged to plant a young orchard. His reply was about as follows: "Well, I sumtimes think I orter put out a new archert, but then agin, I'm afeerd, as I'm gittin' old, I mightn't git *all* the good outen it myself, an' as the old'n will do me out my days, I'll jist leave that matter fur the boys to settle when they get persession."

That was many years ago; the farmer is still living; the old "archet" is nearly gone, but the old argument is as good as ever with that farmer.

When we *contrast* the condition of many parts of Palestine to-day, with the description of that goodly land, as described in the Sacred Narrative, and then, on the other hand, remember that there are fields in England that will produce nearly six times as much wheat per acre as the same field produced two hundred years ago, ought not these facts to cause us to stop and think, and ask ourselves, which way we are tending?

In the words of the poet:

"Of two such lessons, why forget
The nobler and the manlier one."

One of the greatest and most important agricultural problems that ever was presented to the farmers of this nation, or, for that matter, to the farmers of any land or time, was that proposed by Franklin, though little or no attention seemed to be paid to it at the time. It was again alluded to by Chas. Reemelin, in his great address at College Hill, in 1863, and also discussed by one of the faculty of the A. & M. College of Ohio, in the regular course of lectures in that institution. Others may have discussed the same question, but these are the only instances that have fallen under my observation.

That question, as proposed by Franklin, as near as I can recollect his words, was this:

"How shall we live and farm in this country of ours, so that it will sustain after us, a well-fed population forever?"

Do questions of this import ever enter our minds? Do we even show a proper regard for our own children, when they shall succeed us on the stage of action?

Are there not plenty of farmers who seem, by their management, as though they were anxious to get every element of value out of the soil of their farms, and into their own hands, in the shape of money, or something else, and seem to have no care if their farm, after their day, is no better than a desert?

Would it not be far better to leave a child 50 acres of land that will produce 60 bushels of corn to the acre, than to leave him 200 acres that would only produce 15 bushels per acre? Yet the aggregate amount of bushels in both cases is the same.

Are we true patriots, and do we love our country as we should, if we take no anxious thought for the future? Can our country maintain its present standard of excellence among the nations of the earth, much less attain that superiority that we should desire, and believe to be possible, if the greater portion of our farms become so washed, worn and exhausted that the average farmer can hardly make a living for his family? As agriculture is, and ever must be, the basis of our national prosperity, should we not agitate this question before it is too late?

I give it as my honest conviction, that there are already some farms in this county that, without a radical change in their management, cannot support a family five generations hence. To exhaust the element of fertility in the soil, by too frequent croppings, is bad enough, even if the body of the soil remains intact. But to let the soil itself be carried away, by washing rains, through bad management or carelessness, is surely reprehensible beyond the power of language to express.

Again, as the natural tendency of soil is downhill, through the action of the laws of gravity and of running water, some farmers seem anxious to "assist nature" by using a hillside plow, year after year, on the same field, and their efforts are so eminently successful that they have produced banks at the lower side of the field as high as the fence, and a corresponding worthless strip at the upper side.

But probably some good old brother-farmer, who has spent his life plowing and digging, and reaping smaller average crops each decade of his life, will say: "This is all balder-dash; you can't keep our Monroe county soils from washing."

To this we reply: Of course you can't keep them from washing if you always have them in a condition to wash. But it is not true that the very rains that cause so much damage to our corn-fields are the very thing that we want for our meadows and pastures? And there it does no damage to the soil.

I shall close by summarizing, briefly, some of the rules that have guided me for twenty years on this subject:

1. Keep as much land as possible in grass.

2. Plow sod for nearly all crops.
3. Never take over two crops off the same ground without re-seeding. It is best to take but one crop.
4. Turn as much land up the hill as possible.
5. When you intend to plow a field don't pasture it to death, just before you plow it.
6. Pay close attention to the marking out of your corn ground. Try to get the rows as nearly on a water level as possible, even if it does bring point rows in different parts of the field.
7. As soon as a rut or wash shows itself, fill it at once with some material, such as straw or litter. Is it prompt work that saves work and soil in this matter.
8. The old adage: "Plow deep."
9. Never put a whole hillside in corn in one season.
10. It is best to select flats or benches for corn, and have meadow land on both sides of the corn.
11. Raise no corn to sell.

OUR HOMES.

BY MARY C. LANCE.

[Read at Trumbull County Farmers' Institute.]

There is no word in the English language with such an extent of meaning as that one word—"Home." It is the key-note that sounds the heights of happiness to which humanity may attain, or the depths of misery in which the human mind may be engulfed.

"O name for comfort, refuge, hope and peace;
 O spot of gratitude and memory blest!
 Where, as in brighter worlds, 'the wicked cease
 From troubling, and the weary are at rest.'
 How brightly here the various virtues shine,
 And nothing said or done is seen amiss;
 While sweet affections every heart entwine,
 And differing tastes and talents all unite
 Like hues prismatic blending into white,
 In charity to man and love divine.
 Heaven's nursery and foretaste! O, what bliss,
 Where earth to wearied man can give a home like this."

An old writer once said, "the three greatest indications of a people's civilization are the state of the roads, the state of agriculture and the mode of transportation." These no more reflect the civilization or prosperity of a nation than does the state of its homes. The home is the nation's

bulwark, upon which depends its weal or woe. Here is born and bred, not alone the men and women of a future generation, who shall direct the affairs of Church and State, but here are forged, one by one, the links of character, here are developed the ideas of life and its purposes, that shall live through all the after years of existence.

A *home* is not merely four square walls, that shelter its occupants from summer's heat and winter's cold, and its extent can never be told by the ground it covers.

After you have erected the buildings, spread the velvet carpet, hung the gilt paper and furnished the rooms with pictures, flowers, music, books—in short, with everything calculated to banish care and sorrow to oblivion, and enthrone happiness, you have yet to provide the *soul* of the home—a cheerful, affectionate, happy family. One whose governing principle might be expressed in these words: "In essentials unity, in non-essentials liberty, and in *all things* charity."

Without such a household the most beautiful home is but a painting without reality, a statue without life, a mere *pretence*. Many a brown-stone front hides a furrowed brow and aching heart, while the humble cottage may be the dwelling place of love, peace, and contentment.

It is the *country* home in which we are all interested, and which may more nearly approach our ideal. In the early days of settlement, when Ohio was "way out west," the sturdy forefathers of our nation and independence resolutely felled the forests and cultivated the soil, building for themselves rude dwellings, and converting the wilderness into arable land that should yield fruit to their successors. Their life was indeed primitive; how much so can never be realized in this age where advancing thought has invented labor-saving machines, has harnessed steam for its motive power, chained electricity to do its bidding and spread a net-work of iron rails across the continent, making the Atlantic and Pacific coasts neighbors. But in these rude huts, cradled in the mist of privation, and surrounded by only the bare necessities of life, was reared a generation of noble, vigorous men and women, through whose united efforts Ohio has long since ceased to be the "school-books' sun-set land;" her broad acres were made to yield food for the hungry, employment for the idle, and homes for the destitute. Placing us beyond the discipline of material privation, and giving to us as necessities their luxuries. With all this advancement the farmer's home of to-day is not always a thing of beauty to its possessor, or of joy to its inmates, and this fact is due mainly to the farmer himself. Why is it so? Of all classes of people on the face of the earth, none are so independent as he. And of all occupations none is so noble as his.

A writer in an agricultural paper recently said of the farmer: "He has taken root in the soil, like the trees he has planted, whose growth he watches from year to year; intimate with bird, and plant, and stone, he finds pleasure past all enumeration. Every season sees great processions of flowers and fruits, a blessing present for to-day and one in bud for to-morrow. No labor union commands him, with no position in church or State, or society, he has to meet no one's expectations. He delights in the seclusion of his fields and orchards, and his children play under the trees far from the physical and moral contagions that so often encamp in the town.

He is himself the noblest production of nature, and in his business has nature for the senior partner. The blue canopy of Heaven is the vaulted ceiling of his office, the velvety grass, that decks hillside and mead, the rich tapestry upon which he treads, and the open book of nature, from the pages of which he reads nothing impure or untrue, is his daily ledger. He transacts business on a large scale, and his best production is the highest development of a noble manhood. He counts his income, not by what it is worth in the market, but by what it makes him worth. That which is of most value to us has no *money* value. No one can keep a book account of social improvement, intellectual advancement, or the delights of the soul. As well try to buy and sell the beauties of a gorgeous sun-set or the delicate pictures of frost-work.

Socrates says, "Farming is the employment of all others, the most worthy of man, the most ancient and the most suitable to his nature. It is the source of health, strength, plenty, and riches, the school of sobriety, temperance, justice, religion and, in a word, of all kinds of virtues, both civil and military."

With all this on the farmer's side, why may not his home be the very acme of what a home should be? True, he may be poor, but "How rich and restful poverty and toil become, when beauty, harmony and love sit at the humble hearth, as angels sat at evening in the patriarch's tent. When man makes labor noble, and his farmer's frock the symbol of a chaste chivalry."

A drive across the country and view of the farm homes, will reveal to an observing mind the cause of the sneer with which country life is alluded to by our city friends, and the epithets of "Clodhoppers" and "Old Hayseed." Too often we see the buildings arranged with the barn the nearest the road, and the most prominent feature of that the yard that surrounds it, which occasionally is made useful as well as ornamental and by forming the thoroughfare to the house. That house, when reached, would beggar description; taken with its surroundings it resembles the debris of a Kansas cyclone. Everything is piled in a heap in the yard,

the last used article being uppermost, the only ornamentation bestowed on the lawn being the wheel-barrow and soap-making utensils; the chickens and geese contend for the place of honor on the front porch, and the whole yard being under a state of cultivation carried on by the pigs, that roam about at will, resembles a highly magnified picture of the face of the moon with its elevations and depressions. Chaos reigns supreme; and inside the house is as barren of anything instructive or entertaining as was the renowned cupboard of Mother Hubbard of bones.

Small wonder it is that life in that home is dull and tiresome, or that as many of the inmates as possible seek their fortunes elsewhere. And the old cry continues to be heard that "the boys don't like the farm." The city, with its show and glitter, offers many attractions to such, but they could be easily and profitably offset by planning and laboring to make the old home beautiful. And every one can be so made by the exercise of a little taste and care.

The barn is fully as useful when occupying a position to the rear of the domestic headquarters, and the gentle kine can more peacefully chew the cud of contentment and corn-fodder, when removed somewhat from the stare of the traveling public. It requires no more time to store in the back yard what properly belongs there than it does to convert the front yard into a farm "catch-all." The barn-yard fowls, when carefully trained, find just as much pleasure in promenading their own domains as in trampling on the rights of the housewife. With the rubbish all removed, it would be a pleasant and delightful task to train vines, plant shrubs and trees and otherwise ornament the house and lawn.

Nothing imparts a more refining and elevating influence to the home than the cultivation of flowers. They are God's silent emblems of purity and beauty, and at all times are to us messengers of joy. In times of sadness they lessen the gloom, and in times of joy their bright presence adds to the occasion. Nothing so appropriately decks the casket or the bride; the palace of the millionaire or the hut of the peasant. No home can be too exalted, and none too humble for their cultivation. They are the greatest moral teachers in the Kingdom of Nature, ever teaching man lessons of industry, truth and beauty.

"Wilt thou gaze with me on flowers,
And let their sparkling eyes,
Glancing brightly up to ours,
Teach us to be wise.
The poet's eye sees much in these,
To learn and love, to praise and please."

True, it takes some time, and that time may be given grudgingly, if at all. You have all the time there is, and how can you better spend so

small a portion than by educating yourself and family in the works of Dame Nature, the wonders and mysteries of the creations and unrivaled beauty and perfection of her works and art. While cultivating the soil, cultivate the mind as well, like the blacksmith, who edged his wits while he edged his tools, so both were fitted for use.

The literature of the present day is abundant, broad and comprehensive; the subjects are varied and embrace the practical and the scientific, the useful and ornamental, so the taste of each member of the family can be gratified; and nothing contributes more largely to the pleasure and profit of the home circle, than a bountiful supply of reading matter. Books and papers are wonderfully cheap and within the reach of all. It is sometimes said that "the press is the lever that moves the word." It has certainly accomplished no mean result in our civilization and enlightenment. "Watt's Hymns" and "Fox's book of Martyrs," are good reading, but they need not necessarily constitute the sole occupants of the library. Both young and old require something less sombre, and it need not be light and trashy.

The book is the key by which we are able to enter through the doorway of learning, to a world of whose delights and pleasures the ignorant man knows nothing; it lifts us above the cares and struggles of daily existence; fills our minds with greater, nobler thoughts and higher aspirations. Through this culture the mind is drawn out, the horizon, broadened and new beauties revealed. "Mountains of fact rise toward heaven, rivers of thought flow ever onward, broad plains of reason stretch out their limitless expanse," and all unite to draw us from self and raise us above the dark trials of our occupation.

Many a farmer with broad acres would be horrified at the thought of subscribing for more than two newspapers—a county paper and a political paper. He votes the same ticket and farms the same way his father voted and farmed. He regards the visitations of the assessor and death the brightest allurements the future holds out to him, and tobacco chewing and tax-paying the only luxuries within his sphere. He knows naught of the outside world and its doings. He is the man who invests in Bohemian oats, the elevating gate (that don't elevate him), and the patent lightning rod. After buying his ignorance, much dearer than would have been the knowledge to avert the disaster, he vents his spite in grumbling at the hard fate of farmers in general and himself in particular. Poor man! Poor family! Poor *home*!

There are many organizations for the education and elevation of the farmer and his family, yet of all classes and professions, he seems the least to believe that "in union there is strength." There is scarcely a profession or industry but has its organization for protection and the furtherance

of their interests; for this cause the few can control the many. The farming community embraces over fifty per cent. of our population, yet when there are laws to make, the *lawyers* frame them.

These Institutes are doing a noble work for the benefit of the farmer, but with good speakers furnished, and their expenses borne by the State, not one in a hundred of the farmers of this county have ever attended one, even when brought right to their door.

The Grange is an institution solely for the benefit of the farmer and his household. It has for its object the developing of a higher manhood and womanhood. But the very name often causes a shiver of distrust and foreboding to permeate the spinal column of the tiller of the soil. The Grange is founded upon the great principle of truth, justice and equity. It is destined to live on and on, keeping pace with the march of improvement—the conservator of the farmer's rights, promoting the general interest of all people. It has been established for years, appealing to farmers to join in advancing and protecting their class rights and interests, yet but a small portion of our seven millions of farmers are members.

Another factor we might mention for promoting the general welfare, is the Horticultural Society. Horticulture is a broad term, and embraces nearly everything that makes the country beautiful and attractive as man's dwelling place. These Horticultural Societies and influences should be extended until the coming of that "millennial day" when every cottage, and every table shall be adorned with the fruits of horticultural labor and science. It is a study that embraces chemistry, geology and botany. It teaches how labor, when allied with sunshine and rain, is capable of producing the most wonderful results. It enables us to read the history of our plants, from the time of formation, written by the Divine author, upon rocky leaves; and it reveals to us the mysteries of the formation and growth of bud and branch. Of our eighty-eight counties, only eighteen, I believe, have Horticultural Societies.

These are only a few of the advantages the farmer might avail himself of; were these improved, more would follow. But when neglected, as they are, is it any wonder that "Sam," of the *Ohio Farmer*, is led to say that "the farmer must have 'line upon line, and precept upon precept?'" or T. B. Terry to say that "facts concerning the farmer must be pushed upon him, repeatedly, ere he will notice and accept them." Or, again, the Judge, at Lima, to insult the farmer while complimenting the Grange, at its last session, by saying, "If the farmers continue to improve in the future, as they have in the past, the time will come when they will be the equal of other professions."

"Between the home set up in Eden, and the one prepared for us in Heaven, stretches the long succession of our earthly homes."

A minister, once, in his discourse, likened a beautiful home to the veranda of Heaven, from which we would all soon be ushered, by the silent footman, into the eternal mansion.

These earthly homes will be what we choose to make them. They are but the type of man's social and intellectual advancement and tastes. These can be, if we will, so cultivated and educated that our homes shall be the reflex of a refined, intelligent mind, and be rendered so beautiful and attractive that down in the heart of each inmate there will ever be ringing the sweet melody of that familiar old line, "Be it ever so humble, there is no place like home."

THE FARMER AND HIS WIFE.

MRS. LIZZIE STILL, GLENCOE.

[Read at Glencoe Institute.]

I am aware that I stand to-day before those in whose presence I should be silent; but I trust in the few thoughts I have to offer I may not leave the impression that I have forgotten the respect due to age and experience.

Life is ours to enjoy, and life on a farm, all things considered, is most favorable to man's happiness. That we miss that end is due to a mistaken conception of what constitutes the means.

Many people think that wealth is the golden key that is to open to them the avenues of pleasure, and they shut up their minds and hearts to everything else.

Wealth itself is not happiness. There are few farmers who become wealthy on the farm. I believe I am safe in asserting that there are more happy men and women on the farm than in any other vocation in life.

Socrates says that "agriculture is the source of a thousand sober delights and honest pleasures; the mistress and school of all kinds of virtues. It is the employment of all others, the most worthy of man, the most ancient and the most suitable to his nature. It is the source of health, strength, plenty, riches, and a thousand sober delights and pleasures; the mistress and school of sobriety, temperance, justice, religion, and in a word, of all kinds of virtues, both civil and military."

Farm life is our ideal of happiness; the farmer our ideal of independence and purity. We admit our ideal is sometimes marred by the reality, but we cling to it still.

We cannot think of the farmer making an assignment for the benefit of his creditors, or running away with public money, or perpetrating a fraud, but we love to think of him as one of nature's best productions.

There are those who follow farming because it is the only way by which they can eke out a living, and this reminds me of the story of a man who was trying to sell a dog, recommending him as a good coon dog, "because" said he, "he isn't good for anything else, so he must be a good coon dog."

The great farmer is not the man of acres, who can count them by the hundreds, nor yet that other man who thinks only of adding dollar to dollar, but the successful farmer is equal to his business and not above it, who does not farm as though he owed the soil a grudge old as the days of Adam; who chooses his occupation as he chooses his wife, above all others.

There is some things in which the farmer is to be commiserated; one is, the matter of selling farm produce. The buyers are so unwilling to buy. One almost wonders to find buyers at all. The farmer has often to retreat for a cent or a half a cent on the pound or the bushel. Why should he have to ask, what is the price of wheat? What is the price of wool? What are hogs and cattle worth? But he should be humbly and respectfully consulted by the buyers. What can I buy a few beef cattle for? What do you ask for your crop of wheat? The farmer should estimate the cost of producing that crop of wheat, then send his answer.

Just imagine the surprise, yes, the indignation of the manufacturer of agricultural machinery, should some audacious farmer step into his shop and ask the price of plows. Suppose the price being \$40, the farmer offers \$25, saying "that's all they are worth now." The manufacturer will quickly answer, I have capital invested and labor employed. I can't sell plows at that price. Where is the farmer to say: It costs me so much to raise a bushel of wheat, and I must have interest on capital invested. If the farmers would organize, they would soon be a power to control the matter of selling farm produce. The millions look up to the farmer for bread and meat as the helpless fledglings in the nest to the parent bird crying, "feed us, or we starve."

There is another disadvantage under which the farmer labors; the farmer has not more frequent contact with superior minds. The friction that brightens, the intercourse that stimulates, he loses. If it be true that steel sharpens steel, then he grows dull. Why are superior minds so seldom found among farmers? Because superior talent commands a higher price than farming can pay for it.

For, does not the farmer go to the legislature? (and that's the right man to send, if we propose to have the people represented) to the senatorial hall, to the highest seat on the throne of this great nation? Then let

them return to their farms again, as Cincinnatus did, who, from serving his country, returned to his plow again and again, and not like the mouse in the fable, who, having eaten his way into a cheese, could not pass the hole by which he had entered, when he wished to return to his former home, because he had grown too large.

Many a successful farmer has but a limited knowledge of books, but he has an active mind; and how much more satisfactorily might his work have been accomplished had a thorough education been afforded him. The day is not far distant—shall we not say it is here—when it will be a necessity for the farmer to be educated, for methods of farming entertained by our ancestors are now obsolete. It is not necessary that the farmer be versed in Greek, or be able to translate the Pentateuch into Hebrew, or to read Roman History in Latin, or to compute the distances of the stars, or whether the participle should be classed among the parts of speech, or be a walking dictionary; but he should know a little more than to read, write and cipher in interest. He should have some knowledge of the sciences, of physics, mathematics and language, for when he reads he can better understand. In this day of good books and newspapers, the farmer who had not the advantage of an earlier education can, as it were, educate himself now. No farmer who has children, can afford to be without *good* books and *good* newspapers; nor can he afford to have the trashy newspapers, so full of crime, tales, nonsense and obscene pictures.

Now, the farmer has a wife. It is a well-known fact that the farmer's wife is cook, housekeeper, dairy-maid, laundress, dress-maker, tailoress, no mention being made of the calves, lambs, ducks and chickens. Added to these, she is nurse, physician, her husband's secretary and cashier, and more than all, and *above* all, she has the care of all the children, which is scarcely less onerous than St. Paul's care of all the churches. I make mention of these facts especially for the benefit of the dear young ladies here who are contemplating marriage with the farmer.

Emerson says, "there never was a true work of art, a thing of beauty, that was not first an object of utility, the answer to a call of an actual want, beautified and adorned." If this be true, what a glorious sunshine of true beauty lies in halos of brightness on the path before the farmer's wife! For is she not useful? Just witness what she does: three times a day a table is spread with exhibits from the cellar, the pantry, the spring-house, the poultry-yard, the garden and the orchard, all of which she manufactures over a furnace, of which she is both fireman and engineer. She has seething maelstroms, boiling geysers, all under her eye at once. The family gather in, all the articles are ready. They do this three times every day, and there are 365 days in a year. With doing the same thing over and over again, how weary, how

tired to her very heart's core is the farmer's wife. Her husband rides by on his self-binder and she sighs as she sees the line of fallen sheaves. She wishes she could ride around and see the milk skim, the dishes wash, the bread bake, the churn operate, the potatoes pare, the dinner get on, the beds make, the stockings darn, the buttons sew on. When the farmer invents a machine to split wood, feed the hogs, hoe the garden, curry and harness the horses, and hunt the eggs, his wife will not be behind him in an invention. "Oh," says the farmer, "I don't mind a few chores." Neither would his wife. It was not the last straw that broke the camel's back, but an accumulation of straws.

Housekeeping is a fine art, woman the artist, and all attempts at a machine-made home must fall far short of the real, a heart and hand made home.

"A man can build a mansion and furnish it throughout,
A man can build a castle and make it strong and stout;
A man can build a temple, with high and spacious dome;
But no man can build that precious thing called 'Home.'"

Is there, then, no hope for the farmer's wife? She might invent something to do one thing perfectly, be the best of its kind, as a fruit-can, or a boot-jack to wind up, and be in readiness to knock down the first man who would not hang it up. But she has no time, she has no leisure. She annihilates the laws of nature by doing forty things at once. She is in the pantry, down cellar, to the milk-house, out of doors to look after the chickens, to the well for water, to the yard for wood or coal. She washes, irons, churns, bakes, makes and mends and cares for a family of children.

Why is the work of the farmer's wife looked upon as drudgery? It ought not to be so. It need not to be so. There is the steam-cooker, the oil-stove, the washing-machine, the clothes-wringer, the creamer, and numberless articles which the farmer's wife ought to have. Where is the farmer who would think of cutting hay with the scythe, or threshing wheat with the flail? The farmer's wife must blame herself for making her work assume the title of drudgery, for if she continues to bend over that old-time relic, the wash-tub and board, and setting milk in crocks which have probably descended from posterity, her work is drudgery, and she is a drudge. Then she is ever at war with dirt and cobwebs. Indeed, some of them seem to think their only mission in life is to—

"Flourish the mop, and wield the broom,
To scrub, and scour, and dust the room.
With grease, and with dirt, they struggle forever,
Forever at war, forever alert;
They spend their whole lives in a ceaseless endeavor,
Then lay down and die, and are buried in dirt."

We believe the health of the present and future generations depends largely upon the mothers. Occasionally one meets a farmer's wife who lived through years of toil and did not break down. She will tell you how she did her housework, raised her family, and went into the field and helped there, and her story always ends thus: "None of my children can stand what I did." I suppose it must be true that each generation grows weaker and wiser.

When Mrs. Pioneer had cleaned her kitchen, she had also cleaned her sitting-room, parlor, dining-room, and all the bed-rooms, and when the little pioneers were slipped out of their flannel night-gowns into their lindsey dresses, they were in full-dress for the day. These good women spun the material for the family wardrobe, they sewed but a trifle; the garments did not wear out so soon, and little pioneer had a new shirt made of dad's old one, with only a little curtailng, or "taking in."

When will the farmer's wife cease the endless toil of needless work and give more of her attention to her husband and children? Much depends upon the farmer's wife in the moral and religious training of the children. She should be thoroughly acquainted with her husband's financial affairs, that she may better economize the household expenses. She must have a genius for saving, turning everything to the best account; no capital must lie idle; nothing must be lost or wasted; nothing applied to an inadequate purpose that will not do for a larger. She must do as is said of Nature, work every shred, odd and end, into new creations. If a man could be found who could do all these things, he would tunnel mountains, bridge chasms, and lay oceanic cables just for recreation.

How independent the farmer's wife is! She can just fill a market basket with beautiful rolls of golden butter and board the train for the local market to dispose of it, and if she wants a new bonnet she can purchase it without proving detrimental to her husband's purse. She is not compelled to do some special kindness, to gain her husband's graces, or tempt him with luxurious viands of cookery (the way into a man's heart is through his stomach) every time she indulges in a new calico dress, but she gathers a few dozen of eggs and exchanges.

Rev. Monad once wrote, "the greatest influence on earth, whether for good or for evil, is possessed by woman." The farmer's wife exerts a powerful influence, and her opportunity for wielding a permanent influence is greater than in the city homes, which are acted upon so strongly by outside influences. About the domestic hearth she must weave a charm into whose meshes husband and children are willing captives. Her husband must feel that in her his oft-times vexatious cares are dispelled by her loving sympathy and companionship. It is woman's heart and hand that moulds the influences of the home-circle, and through them the church

and state. We should open our minds to the influences of everything that will improve our condition.

Be proud of our vocation, and remember, "It is not the work that honors the man, but the man that honors the work."

DOMESTIC ECONOMIES.

BY LAURA S. CLARK, EMERSON, OHIO.

In this much-lauded and progressive nineteenth century, when the various reforms of the day, moral, social and political, are claiming the attention of the public mind, that of domestic economies is gaining a prominence, which augurs well for the future of our homes.

Several years ago cooking-schools sprung up in England, and in this country; the English taking the lead in organizing them as a part of their national and common school system. But with us they are assuming a broader basis, and instead of merely teaching the art of cooking, we have schools of domestic economy, which includes all things that tend to the preservation, and welfare of the home.

These schools are being established throughout the country, either separately or in connection with colleges, seminaries, or sanitariums, promising happy results in the near future, by sending out thoroughly equipped housekeepers and teachers in household sciences, the pupil receiving actual practice in connection with the theory.

The course included in the curriculum of some institutions, consists in instruction in scientific cookery, in all of its branches, laundrying, dress-making, general housework, household hygiene, personal hygiene, and miscellaneous subjects. To have these subjects thoroughly and practically taught by competent persons, will indeed be a boon to the housewife, who may, perchance, need assistance, but, who at the present time, almost seeks it in vain. Yet, if procured, in nine cases out of ten, is so unskilled that the majority of housekeepers are doing their own work, rather than convert their homes into training-schools, and run the risk of woeful waste during the ordeal.

Fortunately the application of science to daily living is constantly on the increase; and, considered from a moral and hygienic standpoint, there is no reform movement appeals more to the thoughtful and intelligent mind than the present efforts going on amongst us, to secure wholesome cookery and accurate knowledge of facts and rules in dietetic science.

Those who have studied the condition of the working man's home,

have urged and begged that the girls in his home should be educated in cooking and household economies, thus removing what is believed to be a prolific source of intemperance. Believing, as they do, that the ignorance of the women in these homes, in regard to healthful living, is the source of much misery, suffering, and often death.

It is a well-known fact that many of our American kitchens are the strong-holds of ignorance, prejudice, and mental vacuity, which results in Americans, more than any other people, suffering from wasteful, unpalatable, unhealthful, and monotonous cooking. But the time has come when the advance of intelligence, and the spirit of improvement have made good cooking and domestic economies fashionable, and have thereby banished from the kitchen all degrading associations by the presence of trained women.

It is said, "the price of liberty is eternal vigilance," hence might we not say the price of a well-kept house is constant watchfulness. Wise, then, is she who exercises vigilance over her entire house, looking after the many little details of her home, rather than depend entirely upon some Mary Ann, who has the dollars and cents more at interest than the proper keeping of her mistresses' kitchen or bed-chamber.

Many, no doubt, have read the story of the German bride, whose father gave her a golden casket, with the injunction not to pass it to any other hands, for it held a charm which, in her keeping, would be of inestimable value to her, as the mistress of a house. Not only was she to have entire care of it, but she was to take it every morning to the cellar, the kitchen, and the stable, to remain with it in each place for three minutes. After the lapse of three years, the father was to send the key, that the secret might be discovered. Directions were followed, the key sent, and the casket opened; when it was found to contain an old parchment, on which was written: "The eye of the mistress is worth a hundred pairs of servants' hands." Here we are left to infer what followed. And may we not naturally suppose, that a practice of inspection, carefully followed for a period of three years, would be perpetrated, and that the casket and hidden charm would have accomplished their mission?

I wonder how many housekeepers, and farm-keepers, too, there are in this audience, who feel the responsibility of this hidden charm—inspection. (For domestic economies apply as much to the proper management of the outside interests of the home, as to the skill exercised within doors), and into the keeping of every home-maker it is placed. Yet, if he fails to properly use it, he often finds, when too late, the health of his home usurped by disease, which is ever lurking about in unused and dark corners.

The season is drawing near, when the rhythmical sound of the scrub-

bing-brush will be heard again in the land. But before that time arrives, it behooves every housekeeper to carefully inspect and clean all dark corners, cupboards, and closets, not in daily use, from cellar to attic; and all farm-keepers to examine closely the sanitary conditions of the outside surroundings. Let him examine the drain, if any there be, but, it is too true, that many farmer's homes are without this great convenience; when, with a slight outlay of money, and a little labor, it would add to the comfort of every home, both from a labor-saving and sanitary point of view. For it naturally follows, where there are no drains, waste water will be thrown into the back yard, especially during the winter season, then, when the spring thawing begins, what a spectacle is presented! It need not be described.

Yet, all door-yard drains are not a convenience. I once read of a farmer's wife who said, she had spent weeks of time carrying every drop of waste water through the kitchen, and over the entire length of a long porch, to empty into a drain. That drain was neither an economy or a convenience. The loss of time and strength involved in the distance the waste water must be carried by this woman, meant just so much taken from the things which tell on the immediate comfort of the family. Any one who is at all interested, knows how little would be the expense of laying a pipe from the drain to the kitchen sink. But, discreditable though it be, by many heads of families, this is considered an unnecessary expense. Hence, the result, the waste water is either dashed out the back door, forming a cess-pool in the back yard, or the mistress or maid, whichever it may be, must drag out her existence carrying it to a drain.

There are many other little things which the careful and methodical farmer looks after, before the beginning of the spring work, which, if done well, will save time and expense later in the season. The little couplet, "a stitch in time saves nine," can be as aptly applied to the farmer as to his wife, for a nail in time surely saves nine. Yes, not only nine, but ninety and nine. "This power of attention to trifles is the outward and visible sign of the inward and well-ordered brain."

The charm of good housekeeping is the order of economy and taste displayed in regard to details. The little things are the great things, after all; slight mistakes, small omissions, little things done at the wrong time, spoil dishes, and, often, much healthful enjoyment, in the way of disordered digestion, and ruffled temper.

But looking after the many little details of a home, and bringing order out of chaos, should not mean, as it does in some homes, drudgery and continued sacrifice of that which adds to the mental growth and physical need. Yet there are persons who are so thoroughly installed in their own way of doing things that no amount of reasoning would induce them to

change to a better or more practical way, even though it might be an advantage both to themselves and their families.

We often hear of men having hobbies, and riding them to death, but a story is going the rounds of the daily press, which tells of a woman who had a hobby, and who, doubtless, was riding it to the detriment of her mental, if not her physical needs. The story is, that this woman made 799 pies during the year 1888, with the additional statement that she claims it to be the largest number made by any woman in her district—799 pies, 15 pies a week, with 19 left over for any State occasion. Just think of it! What an attainment! She is, doubtless, either one of those goodly creatures who walks in the well-beaten track of her grandmother (for this is a fair sample of bake-day in "ye olden time," as we have heard, since reading the above quoted item, of an old lady, who is still living, whose custom was to bake thirty-two pies a week. Let me see, that would be 1,664 pies in a year. I did not ask who ate them), or is one of those household martyrs who doesn't take any magazine, or even keep up, in a partial way, with the current news of the day, because she has not the time. How could she have? Yet the time spent in concocting such a surprising amount of pastry would doubtless have sufficed to keep her well informed in the current news and literature of the day, and this would not only have been better for her intellect, but also for her family's digestion. To be sure, there may have been mitigating circumstances in the case—the item did not state the size of this woman's family. But, whatever that may be, she evidently was proud of her attainment. And, probably, if she had been asked, "What is the chief end of woman?" instead of replying in the words of the catechism, would have spoken the innermost thoughts of her heart, for, "out of the heart the mouth speaketh"—to make pies.

The time spent by many women in an elaborate and unnecessary preparation of food, would not only serve to keep them well-informed upon all public questions, but would also give opportunity for cultivating their taste in other directions, either for music or art, or both. It is a grand accomplishment to be a good housekeeper, but one cannot attain to this without also cultivating a refined taste and love for the beautiful. For,

"Weeds grow unasked, and even some sweet flowers
Spontaneous give their fragrance to the air,
And bloom on hills, in vales, and everywhere,
As shines the sun, or falls the summer showers,
But wither while our lips pronounce them fair;
Flowers of more worth repay alone the care,
The nurture, and the hopes of watchful hours,
While plants most cultured have most lasting powers.
So, flowers of Genius, that will longest live

Spring not in mind's uncultivated soil,
But are the birth of time and mental toil.
And all the culture, Learning's hand can give,
Fancies, like wild flowers, in a night may grow ;
But thoughts are plants whose stately growth is slow."

WHAT SHALL WE READ? WHAT DO WE READ?

BY MISS JESSIE V. HARRISON, MT. PLEASANT, OHIO.

MR. PRESIDENT, LADIES AND GENTLEMEN: It is with exceeding hesitation I present for your consideration the contained matter of the paper I hold in my hands. Please remember that into this workaday world, theory may sometimes steal, and suggestions may be after all only words. What shall we read? What do we read? Perhaps my surroundings suggest to me the name of a book, a library in itself, a book of many books, the Bible, which, if a man possess truly, he is rich in poetry, learned in history, correct in philosophy, true in science, and devoted in religion.

Perhaps we read the newspapers. We do read the newspapers. Not only the agricultural and horticultural papers with their stores of wisdom, knowledge, information and suggestions, even not omitting their astonishing column headed "Literary," wherein semi-occasionally our brothers, our fathers, our lovers, our husbands, are pictured as men disheveled in personal appearance, untrimmed beard, slouch hat, dilapidated overalls perilously supported by the combination of a suspender and a nail; enormous feet scarcely covered by the ragged shoes of cowhide, and from the mouth the most unconceivable English, that is, when the English can get ahead of the tobacco.

But other papers we scan with care which devote nine-tenths of their space to the city and its interests, to politics, to politicians, to life, to death, and to theories of the hereafter. The newspaper finds its way everywhere, and read it we will; we would not have it otherwise; who would suggest a giving up of sacred reading, or reading of the daily news. What we want to submit to you assembled, is a line of reading that shall act, so to speak, as a balance to the aforesaid reading.

As a member for many years, and a devoted admirer of the Chautauqua Literary and Scientific Circle, I make mention of that course of reading, wherein history, art, science and religion are beautifully combined in a four years' course, recognizing at the same time, reasons why said course would not fill the demand or answer the question: What shall we read?

Books of travel. We want to know more about the world on which we live, magnificent in its mountains, beautiful in its rivers, prodigal in its lakes, silent in north and everlastingly silent in its south, wantonly voluptuous in its tropics, magical in its cities, an eternal—curio. Ah, there is scarcely better reading than good books of travel, interesting books, not dull books; such books have power to make metropolitans of us all, though we have found to “stay at home is best.”

Next to the study of the world on which we live is the study of the race to which we belong, History. We are told to begin with Rollin, Gibbon, Merivale, McCauly, Rawlinson, Bancroft, and work drawn from their universal histories to the history of our own place and time. Is it not a better plan to begin the other way, each family to become interested in the local history of the place, of town, of county, of State, eventually the Nation, and all nations? For instance, before we deluge our families with the war literature, which has been for years flooding this country from the Atlantic to the Pacific, from the Gulf to the Lakes, on the thirtieth of May, take the boy upon the hill yonder and show him that white slab marked “J. L. B., 55 Reg., Mass. Vol.,” tell him of that soldier's enlisting, his service, and why so quietly he rests in “that low, green tent, whose curtain never outward swings.” Then to the war literature—first particulars, then aggregations.

Perhaps for us, the most important reading is the reading of books that cultivate the habit of observation. For such purpose, books on natural history and science are recommended. Some of us have found too often such books have been written by students for students, and not for the rank and file of the people. Those are the books we want—books that will interest all sorts and conditions of people; such books are coming to the front in larger numbers each year. One has said: If you give as a Christmas present to your child, who fancies cats, a little book on the cat, she will be interested in reading it. From the study of cats, and the habit of cats, she may work out into the larger study of other animals. If you give a bright boy Lubbock's book on habits of ants, and then show him, he may learn things Lubbock never knew by studying the ant-hill, which is just beyond the pasture as you go to the saw-mill; you have started him on a career of observation which will make his whole after-life happier. Natural history and science will come in their own good time, if you cultivate the habit, one might say the passion of observation.

The most frequent answer to one proposing or urging a special line of reading, is the familiar one, “What is the use? I can not remember.” On this subject, Dr. D. Swing beautifully says: “Great memories are exceptions, and the lack of them should not be mourned over. Let us accept the situation because of the reflection, that these things once loved

and now forgotten, did for the mind and soul a service of infinite worth. The sentiments which were awakened by these lost books, and poems, and music, were made the lasting quality of the mind, and it will never be again the crude kind of soul it was before it marched through the land of letters."

WOMAN'S INFLUENCE IN THE DESTINY OF NATIONS.

BY MRS. LOUISA B. BROOKS, YORK, UNION COUNTY.

[Read at Union County Farmers' Institute.]

Woman's record, as an influential member of society, dates back to the time when Mother Eve found a willing subject to her suggestions, and we have always been sorry that Adam did not have sufficient moral courage to stand firm for the right and exert a controlling influence over Eve; it would have saved humanity so much trouble. But, perhaps, if Adam had done so he would have felt his superiority so much that Eve and all her daughters would have felt the heavy hand of masculine authority from that time to the present. So we will be glad that it is no worse, and if woman has no other prerogative of superiority over man, we think she has it in point of influence. And thus it is that she wields a mighty power in the destiny of nations. If we look to heathen countries, we find that women are the most ardent adherents of the religion of their land, and in many instances are most averse to any innovations made upon their customs and practices, and retard, to a great extent, all progressive movements. In those countries where Christianity holds sway, we find the true type of womanhood, with all the elements of her Godgiving nature exerted for good; and here it is that we find the highest type of civilization with all of its inventive powers, its brilliant genius and its glowing intellects, elevating and refining and rising higher its standard of excellence. Some one has said that "a land of homes is the measure of a nation's greatness," and we see no reason for refuting it; on the other hand, we consider it a fact that will bear close scrutiny and lose nothing by it. A land of homes means not massing together of serfs and bondmen, subject to the control of some magnate, whose only object is to get all the labor he can at the lowest possible wages, caring not whether they live like beasts or human beings, and they, on the other hand, having no desire for anything better. Neither can we call it a land of homes in the true sense of that name where royalty holds sway, and only those who stand high in the scale of wealth are permitted to be land-owners. We know of no land where this appellation would so well apply

as to our own America, where so large a percentage of the people are land-owners.

Do you ask why land-ownership has anything to do with the question in hand? We think it has a great deal to do with it. Take our own State of Ohio for example. When the early pioneers, with only the rifle, the powderhorn and the ax as tools of civilization, came to this forest wilderness, they did it with the full belief that they were to be the possessors of a portion of it, and they accordingly worked with an energy and spirit that would otherwise have been wanting. The clearing was begun, the rude cabin was erected, and the pioneer home was established; and woman with a brave heart and courageous hand entered upon her part of the work amid danger and privations that we of the present day would feel that we could not endure. But with the feeling that they were to make it their home, the wife and mother plans many an improvement such as their scanty means will allow, that will add to its comfort; and with ever ready tact she strives to weave into the tangled web of pioneer life, those noble principles and refining influences that made so *many* of our pioneer homes the nursery of statesmen whose names are immortalized. Without the presence of woman and the influence she exerted, our early settlements would have been no better than the mining camps of the far west, where demoralization is the rule.

These pioneer homes were opened for meetings until the settlements were strong enough to erect log churches; and school-houses also, when their means would admit of hiring a teacher; and thus it was that home after home dotted the landscape, rude structures though they were, yet they were constantly adding to the value of our State. Coates Kinney said,

"Our fathers fought the armies of the trees,
And chopping out the night, chopt in the morn."

As our mothers reared the home, the farms were becoming more tillable, and consequently were yielding productive crops; new plans were developed for commercial interests; towns and cities were started. Improvement after improvement leaving its impress everywhere, until we who have entered upon its second century almost conclude that Ohio is the hub of the universe.

Let us imagine, if we can, what Ohio would be if it were possible to strike from it all of its homes, leaving all of its great manufacturing establishments, of which we are justly so proud. But no, we cannot train our imagination on that line. 'Tis Ohio homes that measure her greatness; and since the home is woman's sphere of action, and her influence in it is all-pervading, we must logically conclude that woman exerts a

great influence on her destiny, either for good or bad. And what is true with regard to this question as applied to Ohio, is equally true as applied to our nation.

The discovery of America was due to the insight and decision of Queen Isabelle, and woman's hand and heart has played an important part in all the affairs of America ever since that time. We cannot recount them, but can only notice a few that stand out pre-eminent. The women of Revolutionary times have of't been noted for the strong unswerving influence which they so nobly gave to the Revolutionary soldier, and which in no small degree was the cause of their being victorious. There is probable no one woman whose influence has been so greatly felt in the destiny of our nation as that of Harriet Beecher Stowe, by her book, *Uncle Tom's Cabin*. It is a conceded fact that the light in which the evils of slavery were set forth by her, aroused the public conscience on that question as it had never been aroused before, finally culminating in the Emancipation Proclamation of Abraham Lincoln.

A Catholic cardinal thus speaks of it. Cardinal Lavigerie, of Algiers, who has lived in Africa 21 years, and knows slavery in all its horrors, has recently been traveling through Europe, giving graphic descriptions of the pitiful ravages of the Arab slave traders; urging European powers to use their influence in abolishing it. In an impassioned address recently made at Paris, he said: "Christian women! to you it belongs to make known the horror of slavery in Africa. Remember it was the novel '*Uncle Tom's Cabin*,' written by a woman, which, translated into all the languages of the civilized world, set a seal upon the deliverance of the slaves in America." I do not suppose that Mrs. Stowe ever thought, as she wrote that story, that it would result as it did. How the delicate threads of influence flung to the breezes would be watched over by Providence, and finally united into the strong strand of public sentiment, that should wrest the manacles of slavery from off 4,000,000 of human beings and make our United States in deed "the land of freedom."

It is needless for me to say that woman played an important part during the war of the Rebellion, guarding the hearthstones and cheering the soldiers by their letters, breathing of purest patriotism; meanwhile giving tangible evidence of it by doing all they could to alleviate the sufferings that were the inevitable results of the war; while some were angels of mercy in their ministrations upon the battle-field and in the hospital.

We have given you a few examples of what woman's influence has done in the destiny of our nation by a few bright gleaming lights, but we would not forget that the *mother's* influence in the *home*, is the one that *surpasses* all others. To her is confided the infant mind, when she may make impressions upon it as upon softened wax; impressions that shall

grow with their growth and mature with their age; and it is for her to implant those principles in their heart that shall be a blessing to themselves and to the world.

The sentiment that "it is the mother who moulds the man" is well illustrated by the recorded observation of a shrewd writer, who had been among the Choctow Indians and held a consultation with one of their chiefs, respecting the arts of civilized life; and among other things he informed him that "in the start they made a great mistake; they only sent their boys to school. These boys came home intelligent men, but they married uneducated and uncivilized wives, and the uniform result was, their children were all like their mothers. Their fathers soon lost all their interest in both wife and children, as well as in his intellectual acquirements. And now, said he, if we would educate but one class of our children, we would educate the girls, for when they become mothers, they would educate their sons." There is the point, and it is true, no nation can become fully enlightened when the mothers of that nation are not in a good degree qualified to discharge the duties of the home work of education. This does not imply that they must necessarily have a scientific or classified education, but means that they must be prepared to teach by precept and example those principles of love, justice, truth and mercy that are the foundation of a character of honest integrity.

How frequent has the remark been made, by many of our most renowned statesmen, "All that I am, I owe, under God, to the teachings of my mother." Many of those were reared, like Presidents Lincoln and Garfield, under circumstances the most adverse; yet the principles that these mothers inculcated in the hearts of these boys made them a blessing to the nation.

As we look back over the historic pages of the past century and see what the advancement of woman's privileges have been, and how closely they are connected with our increased national greatness, the question very naturally arises, what will woman, with all the avenues of education and business open to her, do for our nation in the coming century?

At the beginning of the present century, her outlook, aside from the home-circle, was a meagre one. If a woman dared to look toward any of the professions, she was at once held up as a target for gossiping tongues. But the prescribed limit of her sphere has widened, here and there a little, until it circumscribes the world. But a few years ago the medical colleges were shut against her entrance; now, we have women's medical colleges, sending forth graduates who honor the profession—many of them going to foreign lands as missionaries, carrying the qualifications for administering to the physical ills of the body, as well as salvation to their immortal souls; and those thoroughly conversant with missionary work,

say that no department of that work is more successful than the medical. Who, then, would dare say that woman ought not to enter that profession? for, by it, she can carry the Gospel where she would otherwise not be allowed to, and by it she is exerting an influence on the future destiny of foreign nations.

Woman, last at the cross, and first at the sepulcher, has ever been an active worker in religious matters; though until recently they have been under the direction of the brothers. Now, almost every denomination has its Woman's Foreign Missionary Society, conducted by women, and while they do not in the least detract from their general missionary societies of their several denominations, they add very much to the aggressive work in the foreign field, as they can enter homes with the Gospel that customs and prejudices would debar man from entirely; and thus they are sapping the very foundations of heathenism, and doing a work whose influence will affect the eternal destiny of untold numbers, as well as work a reform in the government of those nations. We would not, by any means, ignore the great and noble work done by our missionary heroes who opened up the work, all honor to them! and it is from their report of woman's work in the foreign mission field, and the great importance of it, that gives it the pre-eminence.

We Americans are proud to note the church-spires that point heavenward, by the thousands, and forcibly remind the traveler that we are a Christian nation. Stop for a moment and look over the churches with which you are acquainted. Who is exerting the greater influence in their various Sunday-schools, as teachers, training the future church? In most cases, you will find that woman occupies the position of teacher to the great majority of the classes, and by virtue of which, she is in a great measure the controlling element; and in *many* lines of church work you find her occupying a prominent and responsible position. And while her influence is being used to advance the standard of Christianity in our nation, there is a possibility that the time may come when it will be made even more tangible. Take the Boston school question of the past few months. The Catholic element had been quietly working, little by little, until the Boston school board of twenty-four members consisted of eleven Catholics, and several others who uniformly voted with them. In all their committees the Catholic element had the majority. While this was being consummated, the Protestant element had been indifferent to the fact that Boston could suffer from Jesuitical invasion. A change in certain text-books awoke them, and they held an immense indignation mass meeting at Faneuil Hall, July 11th. Similar meetings continued to be held, for at their fall election eleven members were to be elected and they determined to wrest their schools from the power of Romanism. With-

out going into the details of their plans and operations, we will simply say, that upon one ticket the eleven names for members of the school board represented Protestants, while upon the other the Catholics were represented. Thus election day found them. A day of rain from morning till night, with a raw east wind, only such as New England can boast; yet the tide of popular enthusiasm was such that an unusually large vote was polled, and a clean sweep for the school committee of the Protestants was made. In this grand victory achieved, the main element contributing to it was the *woman's* vote. More than 20,000 of them had registered, and nearly all of them voted. As a correspondent of a Cincinnati paper said, "It was an imposing and never-to-be-forgotten sight to beholders to see these brave women facing the storm, that they might cast their ballot against the usurpations of Rome. Not only did they vote, but they did heroic work at the polls. No voter, male or female, put in a ballot without a few words of exhortation on the school and license question by some of these women. To those who had never before witnessed women exercising the right of suffrage, the scene was a strange and inspiring one." The position that the Boston women took on this question was no more decided than what we should expect the women of *other* of our large cities, under similar circumstances, to take; and although we have never desired the right of suffrage for woman, we are compelled to admit that the time may come when the exigencies of our nation shall require *her* vote, in order that our land may continue to be a land of freedom. The educational interests of our land are largely controlled by woman; and to her is now granted the privilege of climbing the hills of knowledge with her brother; and it no longer needs any argument to prove that she has the ability to do it, for the fact is realized that she can master the intricacies of abstruse mathematical problems, the world of astronomy can be understood by her educated eye, as Prof. Maria Mitchell has fully proved, the realm of language is no barrier; and so we might continue, but it is needless. The ability of women to hold the highest position in the faculty of colleges and graded schools we see exemplified in many instances, and would probably in many others, only it has become so natural for man to think that the controlling power was his by right of past customs, quite as much as by any fancied superiority he may have, that he still sways the scepter over the high official positions of educational work. Yet holding that does not give him the precedent in influence. The teacher who, by her loving, gentle ways, wins the hearts of her pupils and sows therein the seeds of earnest, thoughtful, striving after knowledge, is laying the foundation stones of their education. And if, by her patient endeavor, that work is well done, it affects for good all their future.

I do not think I over-estimate when I say that ninety per cent. of all the teachers who mould the minds of our youths in the school-room, until the fifteenth year, are women; consequently their influence in this direction is a mighty one.

The wonderful benevolences of the present day, which make tangible the sympathies of the heart, by making provision for the needs of suffering and poverty, that mar the scenes of prosperity in the world, are largely under the management of women. And if you would see her financial ability, you have, in these institutions, a fair chance. I refer now, especially, to the line of work carried on in large cities, where Homes for the Friendless, Industrial Schools, Old Ladies' Homes, and kindred other institutions, are mitigating the sorrows that come to so many of humanity's offspring. In this connection, also comes the Woman's Relief Corps, the largest benevolent society that the world contains; numbering more than 63,000 women banded together to give relief to those who stood as a nation's safeguard in her time of peril. And while their work in this direction is worthy of greatest commendation, they are also banded together to teach lessons of patriotism, and love of country, to the rising generation. As with one hand they relieve the stern necessities of life, with the other they hold aloft our starry flag, teaching the lesson that, next to allegiance to God, we should show our allegiance to our country and its flag. Our immortal Lincoln once said, "that if all that has been said, by orators and poets, since the creation of the world, in the praise of woman, were applied to the women of America, it would not do them justice for their noble work during the war." While their influence was a mighty one then, we can but think that inculcating lessons of loyalty in the hearts of those who are to rule in the coming years, is supplementing that work most grandly, and not only their work, but the work of the Union Army, from '61 to '65, and ought to exert an influence that will speed the Ship of State onward to the highest pinnacle of National greatness.

Woman's influence in the great temperance movement of the world, has been a most potent one. In the Woman's Crusade of 1874, her power was felt. The Woman's Christian Temperance Union is exerting a power in the right direction, with its National organization of over forty departments, bringing the temperance question to the front, to be settled by constitutional enactment. Probably the largest venture ever attempted by women, was the Woman's National Council of the United States, preliminary only, to the World's International Council of Women.

In the world of literature, woman's thoughts have brightened and lent to it charms that have, like the sunbeam, pierced the innermost recesses of the heart, awakening new resolves for good, and twining the

tendrils of goodness, that exist in the heart, into a strong vine, that shall beautify the character, as the ivy adorns the oak.

We have given you many examples of woman's influence for good, and we wish that were the only influence in her power to exert, but such is not the case, and, for the purpose of showing you some of the terrible fruits of evil influence, we will cite you to Louisa of Savoy, mother of Francis I., King of France. She lived when the Reformation began to unfold its energies in France. It needed only her friendship to secure its triumph. But when her son Francis endangered the stability of his throne, political considerations made her assume hostility to it, and, invoking the spirit of persecution, she set the awful machinery of the Inquisition in motion. Fearful have been the consequences to France.

The Reformation expelled, infidelity sprung up, and become the animating spirit of the people till they daringly defied the God of Heaven. It was in her power to confirm and establish the Reformation, and thus give a blessing, honor and prosperity to her country, but she chose to persecute it; and her spirit, transmitted to posterity, still lives, and from its baneful effects France yet suffers.

Time will not permit us to continue to bring up the many and varied works where woman exerts her power and influence, either for the up-building or the dethronement of the morals of the world. In the examples we have given you, you can clearly see that it has been, and still is, throwing a mighty influence for good over the destiny of our nation. Yet, as we look at the world as it is, and see on every hand the need of greater work, the question comes to every woman, what is my influence, and where can I best use it for good?

'Tis true, that not many have talents like Mrs. Stowe, Mrs. Sigourney, Frances E. Willard, and a host of others; yet no life, however humble, lives to itself alone. Our thoughts, words and actions extend to others and reach succeeding ages. If, as has been stated, "the homes are the measure of a nation's greatness," and home is the acknowledged sphere of woman, where she should rule as queen, the measure of the nation's greatness is under woman's control.

The position of the mother, places her at the headwaters of humanity, where a pebble may change the current of the infant mind. What a responsibility to thus work on an immortal soul! to form a character that may, for its nobility, be more enduring than the most costly granite. Such was the work of Washington's mother; of the mother of the Wesleys, and of our own loved Mother Garfield. But fearful are the results if that character is not moulded aright. If the mother of Francis I had been possessed of those sterling virtues that should have been implanted in her heart in childhood, the Inquisition, in all probability, would never

have been instigated. The Christian patriot and statesman, the philanthropist and the obedient citizen, all receive their first lessons from the mother. And though, in the true home, the mother's work is strengthened and nobly assisted by the father, the constant companionship of the mother and child during its early years, when the most lasting impressions are made, gives her by far the greatest opportunity, as well as the greatest responsibility. With what careful thought, then, should the mother's work be done, since the wavelets of influence, set in motion by her, may become the mighty, surging sea of public opinion, that shall purify and elevate nations, or bring about their destruction.

Upon the mothers of this generation, the moral character of the next will largely depend. An inspector of prisons and reformatories says, "Many a murder tragedy has had its beginning in the mother's lap." And we believe it. With the first gleaming of intelligence in the child, let it be taught obedience to parental authority, obedience to the laws of the land, and obedience to God will naturally follow. It is the only road to good citizenship, and the royal one to virtue. Probably there is no one before me but what can call to mind families within their knowledge, where the mother does not require obedience, and what is the result? A home where discord is the rule, where attendance upon church and school is not required, where promising children will develop into morally depraved men and women, and often into law-breakers and criminals. Grand, yet fearful, are the responsibilities of the mother.

Mothers, let the mission Heaven has vouchsafed to you, make you faithful to its duties.

While the home is where woman finds the larger proportion of her sphere of work, it no longer circumscribes it. Barriers of public opinion have been burned away, and now almost unnumbered vocations are open to her, whereby she may support herself, and gain a competency. This very fact gives to her an independence of character that, rightfully used, has an elevating influence. With all the avenues of usefulness that are within the reach of our American womanhood and the grand privileges we enjoy, there comes to each of us a responsibility which we will have to account for. We must be willing to use the brains God has given us.

The times in which we live, demand more of us than was demanded of our mothers. Let us enter every open door that we can consistently do without neglect of our home duties, whether it be church or Sunday-school work, temperance or benevolent society, or the many opportunities that come in our pathway.

We are each a part of the grand whole, and by doing the duty nearest us, we shall fulfill God's plan for the uplifting of the nations. Sisters,

the royal crown of womanhood, with all its unbounded influences, has been bestowed upon us by our Creator.

Are we fulfilling our mission as God would have us? Does the purity of our lives influence the social circle in which we move, for good, lifting higher the standard of true Christian manhood and womanhood? We must reinforce the ranks of workers for God and humanity if we would overcome the evils that are all about us. Seeking divine guidance, let us aim to be the embodiment of true womanhood, which neither falters nor faints in the face of duty; but with lofty purposes, like a polar star—guiding our life-work, we shall exert an influence for good on the destiny of the nations, that shall live through all the coming ages.

SILO—ENSILAGE—SILAGE.

Silo is derived from the French, and means a *pit* or *cellar*. As now used in England and America it means, a pit or box in which ensilage is kept. The process of keeping green, succulent feed, during the winter for cattle, was brought into practical use by the French, and into marked prominence by Mons. Goffard, a distinguished member of the "Central Agricultural Society of France," "who spent years in patient experimentation before success crowned his efforts." The Romans preserved fruits, grain and forage by burying them in pits. The Mexicans have practiced the art for centuries, and are supposed to have learned the secret from the Spanish invaders.

The system of ensilaging maize was brought into prominence in New England as early as 1880, by John M. Bailey, whose enthusiasm led him to make rather extravagant claims for the method.

The process has been greatly improved, until now it may be claimed as the most economical known for securing the best and cheapest for dairy stock. It is a re-discovery of one of the lost arts, and seems destined to play a most important part in the effort to double the capacity of long-tilled lands of the East and Central States.

The word *silo*, we have said, means a pit or cellar, but it is also used as a verb, meaning to put into a pit. A similar use is made of the word *can*, since the process of *can-ning* fruit has become so common.

The material put into the silo is called *en-silage*, from *en*—signifying *in* and *silage*—contents of the silo. The abbreviated word *silage* is now much used for ensilage, the succulent masses of maize or clover kept in a silo. In the early history of the silo, it was supposed that the more succulent the contents, the better, but experience has shown that the

ensilage keeps better and has more nutritive value, when the maize or clover is allowed to mature seed, until the seed has just passed out of the milk, before the crop is cut and put into the silo.

The rapidly increasing interest in the subject, has led the writer to compile at full a report of the proceedings of the Silo Institute, held at Cleveland, March 5 and 6, 1889, as the space in this annual report will allow. Following this will be found a condensed and abbreviated collection of the findings of the various Agricultural Experiment Stations in the United States and Canada. The aim is to furnish a consensus of opinion from successful practical farmers, and the conclusions and investigations of scientific men, as to the nature, advantages and possibilities of this lost art, now revived.

THE SILO INSTITUTE

Was held in the Council Chamber, at the city of Cleveland, March 5 and 6, 1889. About three hundred and fifty farmers and dairymen from Ohio, Pennsylvania, Indiana and Michigan were assembled. They were enthusiastic in their utterances, and lost no time. It is to be regretted that a program had not been matured in advance, and the subject subdivided, and topics assigned before the meeting. This would have insured a more comprehensive and complete discussion and prevented much repetition and any loss of time on minor matters. It is impossible to give a systematic arrangement of the discussions, as each member asked questions or spoke as the spirit moved him, or as he could get an opportunity.

After electing Mr. Wing, of Mantua, President, and W. N. Lawrence, of the *Ohio Farmer*, Secretary, they were ready for business, and called Mr. Frank Coit, of Mantua, to open with his experience, from which we gather the following:

He had first built a concrete silo; now has a wooden one, and likes it much better. Uses common field corn. Putting up three hundred tons cost \$90, at reasonable farm wages. Will keep a number of years. Can discontinue feeding in June and begin again in the fall. Would prefer B. & W. corn, on account of its good growth. One acre will feed a cow four years, at 90 pounds per day. When feeding nothing else, feeds about 50 pounds per day. It advanced the quality of milk, as attested by scientific tests. Eighteen to twenty-four pounds of milk from ensilage made a pound of butter, while thirty-one pounds of milk from dry feed only made a pound. Would drill the corn—eight to twelve quarts to the acre. A half-bushel is too much, it destroys the growth of the corn. Fed cattle with success. Excellent for horses. Had not tried feeding sheep. Had fed it to hogs with whey, with excellent results. Increases the feeding quality of corn in every particular. Takes forty pounds per day for an idle horse in winter. Will put flesh on a horse rapidly. A horse cannot get enough. Cows will relish ensilage when brought off grass—fifteen pounds of it. Feeds six to seven pounds additional per day for milch cows. Must feed some hay for a quid. Never fed ensilage later than June. To keep ensilage over summer, level it and let it take care of itself. It will form a scum. To refill, take off the scum. In filling tramp the outer part, so that in settling

the air will be expelled. Keep the centre the highest. Excellent for growing colts. Used a cutter which cut stalks one-half inch long.

J. H. Breck, of Newburg, Ohio, preferred a stone silo, on account of durability. Would advise to build in a bank barn and have it as convenient as possible for feeding.

R. A. Ballard, of Salem, Ohio, manager of Brooks' farm, said in regard to the effect upon milk and cream on an ensilage diet, that it was excellent. Feeds ensilage the year round, with but little pasturage. Fed until August last year. Used B. & W. corn wholly. Silos contain about one hundred tons each. Over one hundred and twenty acres of corn. Ensilage kept better in lumber silos than in concrete, the temperature being lower and better. Silage in concrete more sour. Feeds twice a day, right after milking, fifty pounds each a day to cows giving milk. At noon feeds hay. From two to four quarts each of grain per day. Grain consists of one-fourth chop, and one-fourth old process oil meal. Gives best results for cream. Five gallons of milk make a gallon of cream. One-fifth of the milk good cream. One gallon of cream makes one and one-half to one and three-fourths pounds of butter. A little more than a half-gallon of cream for a pound of butter. Had built last two silos inside of barn. Costs him twenty-seven cents per ton for putting the silage in the silo, counting only labor. Takes one ton per month per cow. Fills silo by cutting in as fast as possible.

Mr. Coit: Filled at two different times with best results. If silo is air-tight it can't spoil. Cows will leave the best hay for ensilage. Mr. ——— had not good results by filling a part at a time. Loss by mould. Mr. Carothers, of Hancock county, Ohio, had same experience.

Mr. Talcott: Filled silos as fast as possible with good results. Tried slow filling, but found it took too much time. Ensilage all right if the material is matured and silo all right. Puts a foot of chaff and rough hay on top. Had tried board covering, but the other did just as well. Can keep fifty per cent. more cows on the same amount of land.

Mr. ———: Would advise partitions in silos for a small number of cows. Does this to retain heat. Always feed from the top. Keep it warm as long as possible. Would never build a pit less than eight feet square. Will pack much better in large pits. Would advise filling with clover. Cuts the clover.

Mr. E. Smalley, of Madison, Wisconsin, gave a short history of silos and ensilage, and discussed the advantages of the same over the common methods of farming and feeding live stock.

Mr. Foster, of Summit county, Ohio, found it the best way to dispose of corn that had been blown down and could not be utilized in any other way. Can't get his cows to eat hay since he has been feeding ensilage. Never had calves do so well before, but did not find any twenty or twenty-five per cent. better returns.

Mr. Caruthers: Objects to acetic acid in ensilage, but likes the lactic acid. Fed everything on his farm, chickens and all. Filled a fifteen-foot square silo, sixteen feet high, on four acres.

The above were the most prominent points brought out in the talks on Wednesday forenoon.

PAPER BY DR. G. C. ASHMUN, HEALTH OFFICER OF CLEVELAND.

I shall preface whatever I have to say this morning by saying that I was born and reared a farmer, and was accustomed to all sorts of farm work, and to mix with farmers in all sorts of farm work; so that whatever I do in life is based on the fact that I was born and brought up on a farm. And I think I am more able to appreciate all the work concerning the raising of stock and the production of crops than I otherwise could have been had I not been reared on a farm. Of course, for the last part of my life I have been engaged in other pursuits, and, for the last eight or ten years, I have been connected with the health department in this city; and among other things, have been interested in the quality of the milk supplied to the city, and have had occasion to study at subject in connection with the milk supply of the city. And in the various depart-

ments of the milk question I find the longer I study it, and the different factors which enter into that subject, that it reaches a great deal further than most people think. Those of you who have produced it have entered into the study to a considerable degree, and I may say some things which may not agree with your belief in regard to the subject of milk production and of the proper feed for the production of milk.

MILK AND FOOD OF COWS DURING LACTATION, OR PERIOD OF MILK SECRETION.

The production of the animal substance called milk is accompanied by similar, if not identical processes in all animals classed under the head of the mammals or mammalia. The final step in the process is taken by or through the action of the mammary glands. These glands, during certain periods and conditions of life, are in a state of inaction; they are at rest in respect to their peculiar function and product. At other periods of life, they are more or less active, and furnish a secretion which usually is the food supply of the young animals of this order. And the process of reproduction on the part of females in this class of animals appears to be essential to the excitement of these mammary glands to a true secretion of milk. The secretion or stage of gland activity established, there is a very wide variation in the product throughout the various species embraced in the order of animals, but in a state of nature; that is, the best conditions for development and health of the parent and offspring, the milk of each species is very uniform in their elements and their proportions.

The normal length of time or duration of lactation, varies in the different species of mammalia, according to the rapidity of development in the young, especially to the mastication and digestion of other forms of food than the mother's milk. In those animals where the development of the young is rapid, a correspondingly rapid change takes place in the mother's milk to meet the needs of the young animal, and as a rule, where the development of the young is rapid, and the stage of lactation short, the young are produced in greater numbers. In view of these well-known facts, in fixing a standard of quality in milk from any particular species of the mammalian class, due weight must be given to their life history. With cows re-production brings the mammary gland to its full development and functional activity. We know but little in regard to them in an uncultivated and undomesticated state, so that it is of little use to attempt an estimate of their milk product under such conditions. But much is now known respecting the milk-producing functions in cows, as they are under domestication, and it is with the domestication side of the subject we are now interested.

We then have presented several factors pertaining to the cows themselves, *i. e.*, (a) the breed and normal temperature; (b) the age, either of an individual cow, or average age of a certain group, herd or breed, at the time of observation; (c) the stage or lactation; (d) the food, drink, atmospheric condition, and all that is embraced under the head of care; (e) the objective. These factors are all more or less under our control, and the intelligent direction and modification of them constitute a large, if not the main, part of successful effort in the milk-producing business. It would take volumes to express what is known on these topics, and centuries to develop the unknown.

As this convention has been called with reference to one particular topic, *i. e.*, the food of cows giving milk, or especially a comparison of certain kinds of food, it is quite sufficient occupation for the time allotted. To secure the glandular action which produces milk, as stated, the cow must have passed through gestation of the period of carrying her calf. Not until the last month of this period, usually, no matter what she eats or drinks, is true milk, formed in the udder, unless she is still under the effect of a previous gestation. But when the glandular action is established, the largest element in all animal milk is water. In the milk of cows there is, on an average, about 87 to 90 per cent. of water. The part played by water, in the process of secretion and excretion of milk, must be both as a stimulant to the gland and as a solvent or carrier of other substances. Before the secretion of milk in a mammary gland, such as the cow's udder, takes place,

the blood-vessels of the gland begin to be distended with blood, and both arteries and veins are in a state of congestion, *i. e.*, the blood is delayed on its passage, or completely stopped, and from the pressure thus created, the glandular action is excited and milk produced. But all of the elements constituting the milk are derived from the blood and lymphatic vessels, and the contents of these vessels depend upon the food material supplied, and the perfection with which all other parts of the nutritive process in the cow are performed. It is clear that not only must the health of the milk-producing animal be maintained at as near the normal or perfect state as possible, but that, within certain limits, the milk may be made to correspond to the food consumed without injuriously affecting the health of the animal producing it. And this leads to the objective side of the question, in feeding cows or any other animal; if the object be to fatten, or to give strength or milk for the young, certain kinds of feed and certain amounts are selected.

Ensilage is partially the product of the fermentation process. Not all of the starch, glucose or gluten are changed usually in the samples I have examined, but a portion of these substances which the corn plant contained are changed, with the result of giving a percentage of the product of fermentation. Similar substances are acted upon in a similar way with similar results, both in beer-making and bread-making, and the process of fermentation is checked in beer by cooling, and bread by baking, while in ensilage it varies with the temperature and admission of air. If, when the silo is opened, the weather is near at the freezing point, the fermentation going on will be checked; but if the temperature rises above 45° Fahrenheit, fermentation of the portions yet unchanged will again proceed, and, if continued long enough, will result in entire decomposition and disintegration. In this climate the seasons of plant growth and ripening affect all plants to such an extent, that for nearly all animals some provision has to be made for the months when plant growth is at rest. Herein lies a question. Is it in accord with the normal life of the animals dependent upon the plant of a given district for subsistence, that they shall not follow the order of nature in these plants, and in one part of the year, take them fresh and juicy as they grow, and at another portion of the year take them cured or dried? Would the more juicy food of summer suit the demands of the cows in winter?

Ensilage containing a large percentage of water, and the juices in the corn, which are somewhat solidified in the drying process, in the silo process are kept in a more soluble state. In the acid developed by the "silo" process, together with the changed starch and saccharine elements, and alcohol produced in the change, the organs of excretion—kidneys, liver, etc.—are stimulated to an activity not seen in animals fed on dry or unfermented foods, such as brewers' grains, meal, bran, cooked potatoes, etc., allowed to stand and ferment. In respect to the secretion of milk, the mammary gland is affected as are the other glands, and for a time at least all the constituent elements of milk are secreted in increased amounts, but not in the same ratio. The proportion of water is increased, as a rule, more than the solids, unless some other foods are used which tend to counterbalance the gland work in this respect.

Dr. Ashmun said in answer to question in regard to samples of milk submitted for examination: Where ensilage has been used, either wholly or with other feed, we have found there was a larger proportion of water and less of fats and solids, per one hundred pounds. This has been so constant a result in all the samples which we have had to examine, that I have reached this conclusion, that the effect of ensilage upon the milk of a given cow, or a given number of cows, will be dependent upon the amount of ensilage fed in comparison with other feeds given. At the same time, I will say that it may be used as a glandular stimulant to produce increased quantity, and the quality will depend on whether you use ensilage exclusively, or with other feed. I will say that it can be used within a cer-

tain limit without deteriorating the quality to an unwholesome or unfavorable condition.

Question: What amount can be used without bad effects?

Answer: We have tested the milk where they fed it constantly, and where a definite portion was used, not exceeding the entire quantity of feed, and the quality was maintained to a good degree, and in other cases where it has been fed in large quantities, and the quality was not up to the standard of this State, or of any other State.

Question: I would desire to ask the Doctor if, from the examination he has made, where he has pronounced the samples to be the best, if it would shake his belief in the quality of the milk, affecting it injuriously?

Answer: I am not stating a belief based on the examination of any one sample. We have made about three thousand examinations of samples, and I do not propose to be put on the stand as a detective, but to get at the best results for the producer and consumer. If I were to take one sample as a basis, it would not be conclusive. But it is only in taking a number of samples that we get the general result. We find certain samples good, and others bad. Some of you would have been glad to have us find some samples good and others bad. We care nothing about that, but the point is to get at the general result, and it has shown that a mixed feed, in which ensilage played a part, produced a better grade of milk than where the ensilage was fed exclusively.

H. Talcott: After three years' experience with ensilage, and having visited a great many that are using it, and seeing the milk produced from it, and from dry feed, I should never believe that the quality was affected, unless the samples were submitted to a chemist, and he should be honest.

Mr. F. R. Coit, who had sent samples of milk to the Doctor, was then called for.

Mr. Coit: Seeing a report in the *Plain Dealer*, a few weeks ago, in regard to milk produced from ensilage, I asked ————, of Stranahan's Creamery, if he would make a careful examination of samples of milk produced from ensilage feed. He said he would be glad to do so, and he made a test of 224 pounds of milk. He let this stand for twenty-four hours, and took the cream, and found that eleven pounds of the milk would make a pound of cheese, and this 224 pounds of milk produced ten and one-half pounds of packed butter. The milk stood $12\frac{1}{2}$ in solids. He also took the same amount of milk, produced not closer than within two miles of a silo, so that it could not even inhale the breath of one, and found that it took 5,800 pounds of milk to make 121 pounds of butter, and 145 pounds of cheese. This led me to send to Dr. Ashmun three

quarts of milk. One I labeled, "Milk produced from full ensilage." I took another of the same kind and marked it, "Milk produced from dry feed," and the other "Milk produced from dry feed and ensilage." I have the Doctor's official report. The solids in that labeled dry feed was — and 2.15 fats, while the ensilage report is nearly 13 solids; both fed pure ensilage feed. I wanted to find out whether our Grade Jerseys would make the greatest amount of solids, and the report shows that they produced nearly 13 in fats and solids. Now, I did not do this for any detective purpose, but only to satisfy myself whether I ought to have the same price as others, who made butter from the same grade of milk.

Mr. Prosser (?): You selected your milk, and the others had mixed milk?

Answer: No, sir, it was not mixed; it was supposed to be from Short Horn cows. It was not mixed; at least, if so, it was done on the farm.

Dr. Ashmun, being called by the President: I want to say a few words in answer to what has been said, although it does not amount to much, one way or the other. When these samples came in, marked as they were, of course the purpose may have been all right, but I had a suspicion, as I always have in such cases, when parties send samples in labeled in this way. But the samples are all put through the same process precisely. I will say this—and you can appreciate it, I think—there is one kind of cream, and another kind of cream. One sample may carry a great deal of casine, and another very little. It may vary as to the amount of fats. You will remember that the analysis does not state the amount of cream, but states the amount of fats. As I said before, it depends on what we feed for. The milk may be very good for cheese, and very poor for butter. The question of ensilage is a very broad one, and our examinations are the very beginning of the ladder we are to climb. The question of how long the cow's health will continue good on this feed comes in, whether it will do to feed it continuously or not. I do not know that the whole product is increased by the ensilage. Whether there is a greater percentage of the fats, and all the solids, than without it. It is stated that such is the case. Whether that will be continuous, is an open question. So far as I know, no step has been made to determine that question. One set of samples, or one year's product, I should not hold to be conclusive, because our seasons differ. The corn grows different one season from that of another. One year it will be particularly full of water, and will not cure so well, and is more difficult to keep it in good order. That makes a great difference. There is a difference in the silos and in the ensilage. You are just beginning on this question. It will take years, not only for the chemist, but for the feeders to determine it.

President: I will state that I sent to Dr. Ashmun, as I have done for several years in succession, samples of milk produced from ensilage. My report stood 12.20 solids, without any grain ration. Now, where is the limit to which we can feed ensilage without damage to the milk? The sample of ensilage I sent him I sent for my own private information, and I was surprised to learn, according to his report, that there was only 1.99 per cent. of loss. We cannot preserve fodder and save all but 2 per cent. of it by any other method.

Dr. Ashmun: The question has been asked, "How far can this kind of feeding be carried?" I do not know. It can only be determined by experience. No two men are made just alike, and different human systems require different treatment; so with the cow. The cow that naturally was giving a large proportion of water might be stimulated to a limit where the milk would be of the poorest quality. With one of a sluggish glandular action the feed might produce the very best results that could be produced. When you ask me what proportion of this feed can be used, I say I don't know. It can only be determined by you by a long continued experience. It will take a good many honest men and honest observers, not observing, to find out the highest limit of defrauding consumers without being detected, or the greatest amount they can jerk out of a cheese factory, to get at the correct result; to sift out the truth as to what the cow will give, as she gives it, and maintain the very best results. It seems it will take a large amount of this kind of experience by the best men to determine the question. I have no doubt a proportion can be fed and fed profitably, because it keeps up the glandular action to the best work. I understand the fact that in some locations there was too much fermentation in the ensilage; that it was not properly cured. I have no doubt that if the ensilage is preserved as the sweet grasses of the field, there would be no question as to the character of the product from it. We all know that the largest and best product that has ever been obtained is from the sweet grasses of the field. It was the sweet grasses of the field that suggested ensilage. It was argued that if the natural succulent plant could be preserved as the grass of the field in summer, then we should have a perfect feed, and so from that has proceeded this whole investigation. How can we procure that feed? That has been the object of this whole movement. In the early history of the ensilage movement, a great many mistakes were made in attempting to keep unripe corn, and there was too much fermentation. There was a great many mistakes made in the construction of silos, and in filling of silos, and in the early history of this whole movement, the acid in the ensilage made it objectionable, and the product was condemned by the health officers of New York, Boston, and other cities; but later a sweeter

and better ensilage has been produced, and it is expected that the inspection of this ensilage will decide this whole investigation. But this ensilage question is only in an experimental state. It has been tested by the chemist, but science and experience has shown that the laboratory of nature can do better work than the chemist. We have had some of the finest attempts of the chemist in the laboratory, but they cannot approach the laboratory of nature, so that the whole matter was rejected because of fermentation. The question then is, can we bring the product to such maturity as to prevent such fermentation, so as not to destroy the gluten and saccharine matter of the plant. As I stated before, all plants are built up of cells, and the cells contain the gluten, and starch and saccharine substance, and the natural plant, whether fed from the field or from the silo, is the perfect plant if it is kept sweet or comparatively so; and so the sweet ensilage, as it is called, if there is not too much fermentation, is digestible and succulent, and the other is indigestible. In the process of curing hay or corn-fodder, a large per cent. of the succulent matter is burned up and destroyed utterly, and a large per centage is rendered woody and indigestible and not assimilated by the animal. So the whole question is, whether you can preserve the ensilage comparatively sweet or not; and if you can, then there is no question as to its value, because it has already been demonstrated that the sweet grasses of the field produce the very best product, and the largest and best product is from the natural plant.

Question: How much acid is admissible?

Answer: We find from one and a half to two per cent., not often exceeding two per cent. If there is too much acid you will find that it will quickly decompose. It will not stand as other milk.

If the ensilage could be preserved as fruit in a can, there would be no difficulty. It is only when there is too much fermentation and when it is badly preserved, that there is difficulty.

It is found that there is acid in the milk when first drawn, where green, rank grass is fed. This is not the acid of fermentation; it is sulphuric acid. This acid can be detected by litmus paper when the milk is first drawn.

Question: What objection is there to the acid in the milk for family use?

Answer: There is more or less acid in the milk, but I was not referring to the acid in the ensilage, but only to the acid as indicating the gluten and saccharine elements.

J. H. Holcome, Medina county, Ohio: There was a question in my mind as to whether the supply of food, such as the growing plant

would supply, was necessary for the winter supply, or whether the animal followed the order of the plants in their food, and did not need the same kind of food in the winter, and that the supply was such as they needed. I think it is an open question whether the health of the animal would be maintained with this kind of food, and with this kind of food, if there is too much fermentation, the question is, how long can it be continued.

Answer: How long it can be continued, and to what extent, can only be determined by experience.

Mr. Coit: Can you increase the quality of the cow's milk by feeding for it?

Answer: I haven't any doubt of that. You can improve the quality and deteriorate the quantity. I think that is a common experience, and a common observation.

Moved and seconded, that the Doctor be tendered a vote of thanks for his paper and remarks.

Doctor: I was asked to give the results of our examinations, and I came here stating that I was born and raised a farmer, and that my sympathies were with those in that business, and that I wanted to get at the truth. I do not think we have reached the limits, and I do not feel that we know the end of the matter. There might be volumes written on this subject, and it will take more than my lifetime to get to the end of it. In answer to the question in regard to the water, our observations show that the best milk comes directly from the hands of the producers, and that it deteriorates as it changes hands, and we found the poorest in the little shops over the city. There is an unavoidable change caused by changing it from the cans, which must always be allowed for, and there is no agency known that can restore it to its first condition. In the cooling process the fat globules are liberated and begin to rise, and then in the handling, they are moved back and forth, and some are kept in the body of the milk continually, coagulating, and casein is formed, which change must be allowed for. I would state that in its first stage it is purest, and this last form must be allowed for.

Mr. Foster, of Northfield: In view of the fact that the milk is constantly changing in condition, we, in our part of the country, ask that if our milk is to be tested, that the inspector be sent out to our stables, and not test our milk after it comes into the city.

President: Dr. Ashmun is on your side, and will do you all justice.

Dr. Stuart: The position of Dr. Ashmun is that he comes in between you and the retail dealers in his examination of the quality of this milk. The farmer is entirely ignorant of the kind of milk that is supplied to the public. The party between the farmer and the public gets the cream, and what does he do with it. We might find the secret from some dairy. We

should take Mr. Foster's plan—just as the milk is produced from the cattle; that is the honest way to test it, and give the honest man a fair show.

Question: As the solids were shown of the June and December product, and the June product is not any better than the December, will not the silo keep the cattle in good condition, and if the stables are kept warm, so that no frost can enter them, can we not expect as good results in winter as any part of the season?

Dr. A.: There is a difference in the different seasons of the year, and our tests go to show that when the grasses are rank there is a larger percentage of water. So, also, when a cow has lately come in, the first two weeks will show a larger percentage of water, although in the whole bulk you will have more fat and solids. In December, when the cow's milk is less in quantity, the percentage of water will be less.

Mr. Talcott: The Doctor has compared the ensilage to the brewers' malt (?) and the product of the glucose factory, and to the sulphuric acid used in the manufacturing of glucose, and I will say that it changes the product so much that it can not be used in the manufacture of cheese. You can not make a curd, and where our dairymen attempted to use it, it spoiled the cheese. I do not think it is fair to give the idea to this convention that it is at all comparable to that kind of feed. This is a matter of principle, and we are attempting to establish a great farm economy, and if we produce ensilage that makes a superior quantity and quality of milk, where, according to Mr. ———, a pound of butter is produced from twenty-four pounds of milk, we do not think we are advising you to adopt a quality of feed that is to let down the quality of milk one particle.

Dr. A.: I hope I was not misunderstood. I only referred to the matter of fermentation.

President: This meeting was called to find out the value of ensilage as a feed for the production of milk, and to settle the question as to the quality of the milk—to find out whether it is bad or good. I claimed my sample was produced from ensilage feed. If the feed was unhealthy, I was hoping the Doctor would find it out.

Dr. A.: The samples were found to be good, and the milk healthy. There is always some allowance made for the labeling of samples, and I did not find out until afterwards, that these samples were wrongly labeled, but we do not rely very much on the labeling. Some of the samples were good and some were bad. Mr. Wing's samples were good.

President: I am eased up and feel good.

Motion to give the Doctor a vote of thanks was then carried unanimously.

Dr. A.: I am glad to have met you all, and if at any time you have any trouble on the milk subject and will send word to me, I will do my best to make it right.

Paper read by G. E. Rice, of Warren, Ohio :

THE SILO FOR THE AVERAGE FARMER.

In treating of this subject in the following paper, I shall aim to give some hints and suggestions that seem to me to fit the case of the average farmer, who is in want of a better and cheaper method of feeding, and especially wintering the stock usually kept on the ordinary farm. In the formation of these opinions, I have been guided by my own experience and observation, and by the experience and observation of a dozen or more of my acquaintances, whose silos I have visited for the purpose of obtaining such information. I have gathered this information during the past three or four years. In building a silo, as in building a house or any other building, while there is no limit to the expense which we may put into it, there is a limit to the cheapness of the building, beyond which it is not wisdom or economy to go, and in these hints, or suggestions, I have endeavored to keep this point constantly in view.

The first question to be asked and answered by the farmer, who has concluded that he cannot afford longer to be without a silo, is, where shall I build it? My answer in general is, in the hay-mow, because you will not need so much room as heretofore for your dry food, as you can store from three to five times as much cattle-food in the silo as you can in the hay-mow; because you can build cheaper, in most cases, in the mow than anywhere else, and because it is generally the most convenient place from which to feed. In building any kind of a structure that we wish to use for a term of years, it is highly important to have a good foundation, and in nothing is this more important than building a silo, because there will be a very great weight on the bottom, and some horizontal pressure on the sides. Still, I am inclined to believe there is very little side, or lateral pressure, when we fill our silos with ensilage made from mature corn, clover or Hungarian. If your barn is like nine-tenths of the farms on the Reserve, (an old-fashioned, 30x60-foot barn, set on stone abutments, or boulders), my advice is to put a stone wall under all of the sills of the barn, if you can, if not, under so much of it as you wish to make into a silo. Dig a trench in the ground, one foot wide and eighteen inches deep, directly under the sill, with an outlet at the lowest corner. Fill the trench about two-thirds full with cobble, or broken stones, laid in with the hands, then lay on a few sandstones and pound it down smooth and level with a hammer, to make a level surface on which to commence the wall. Build the wall with the inside face flush with the inside of the sill, first laying down a good supply of mortar. Use plenty of mortar all through the wall, so there will be no rat-holes. In digging the trench, throw the earth on the outside, and when the wall is done, bank it up on the outside, to throw the water away from the silo. Having the wall built up to the bottom of the sill, we are ready to commence on top of the sill.

As this is to be an average silo, a kind of happy medium between the heavy, expensive stone or concrete walls, and the cheap and almost worthless wooden walls. In selecting studding for the side, we must be governed by the depth of the pit, and the support the studding will receive from the frame of the barn. In the side supported by the girts of the barn-frame, 3x4-inch studding is sufficient, if supported by a board nailed on top of the girts, with the edge resting against the studding to prevent their springing. For the sides not supported by the barn-frame, and for the partition walls, the width of studding will depend on the length. For ten or twelve feet, use studding six inches wide; for fourteen or sixteen feet, use eight inches wide, and for eighteen or twenty feet long, ten inches will be required to prevent springing. Set all the studding sixteen inches apart from center to center, with the front edges one inch back from the edge of the sill, and

toe-nail thoroughly with 20-penny wire spikes. If you want two pits, and I think two far preferable to one large one, you will need a stone wall for the partition to stand on. It must be of the same height as the outside walls, and three inches thicker than your partition-studding is in width. Now, lay a stud on this wall and toe-nail each end strongly to the sills; lay another on this and spike them together and to the sills. It makes it still better and stronger to lay on the third one and spike well to the sills and together. Then set up your studding for the partition, and spike another on top for a plate, and this is also better for having a second one well spiked to it. Be very particular to fasten well at the ends.

We are now ready for the ceiling, which can be of any lumber one inch thick. Thinner will do, if all of one thickness. Board up the whole of one side, letting the boards run through to the outside of the studding, so that you can spike on another stud to turn the corner. If this is well done, it prevents spreading at the corners and loss of valuable food. When you have it all sided up, cut out a door by sawing off one stud about three or four feet from the top and two or three feet from the bottom of the pit, also sawing the boards down the inside of the studs next to the one sawed off, saving these boards, which will fill the door again by simply nailing cleats on the studs at each end to hold them in their places while filling the silo. After ceiling, I used tarred paper 36 inches wide, the strips running up and down and held in place by strips of wood to lath on. These strips are one-half by two inches, and nailed directly over each stud, which brings them sixteen inches from center to center, which is just right for common lath. The tarred paper will lap about four inches on each alternate stud. Lath as for a house, except that the spaces should be a little wide. Have it plastered three coats by a mason that understands using cement, mixing white lime, and cement for the first two coats, and making the third coat of cement and sand alone.

You now have a wall that is as near air and water-proof as it is possible to get, cheap, and one that will not shrink and swell like one made entirely of boards, and will not freeze through in any ordinary weather. In plastering the last coat, let it run down over the stone wall to make it air-tight, and bring it out flush with the plaster on the lath. To make the bottom, level off the earth, tramp it down hard and smooth and give it a coat of cement one inch thick. Be sure to have it tight where it joins the sides. You now have a room with air-tight bottom and sides, which is the whole secret of a good silo. I am aware that some will tell you that a sill laid on the ground with a frame built on that and two thicknesses of boards, is all that is necessary, but my observations have proved quite the contrary. In every case that has come to my notice, in a wooden silo, there has been considerable waste along the sides, and especially at the corners, from mold, caused by air getting in through the cracks. The same conditions have not been found in any of the larger number built of stone, or plastered as I have described. None of us want to go back to the old way of ceiling our houses, which will cause the paper to crack and let the wind in every windy day. Since the plastered wall is only a little, if any, more expensive than the ceiling, we think it poor policy to run the risk of losing a considerable portion of our ensilage, as we are almost certain to do with the board silo. Of course, if we only expect to use the silo one year, or even two, we would build by laying a sill on the ground and using earth for a floor, building in the cheapest way. But we who have tried ensilage have no idea of giving up the silo; therefore, I say, by all means begin your silo with a stone or concrete wall for a foundation, whatever you may put above that. No rational man of ordinary intelligence commences to build a barn in this enlightened age by laying a sill directly on the ground for a foundation, and would it not be as poor economy to commence a silo in the same way? Those of us that were born and raised in the old log-houses on the old homesteads, well remember how the houses gradually sunk deeper and deeper into the ground, until we used to bump our heads at the doors if we forgot to crouch a little when we came in. And as it is not fashionable to bow at present, we do not wish to bring the old custom into fashion again.

A few words as to filling and feeding, and I am done. If the weather is favorable, cut the corn, lay it in gavels, and let it wilt two or three days before filling, but if it is rainy weather cut and haul at once. If the corn is dented, you can fill without waiting for it to heat and settle. If it is not dented, fill four to six feet and let it heat to 115 or 125 degrees, then fill again, and so on till full. If you have a good crew, and are rushing things somewhat, put a good man (not a boy) into the pit, and have it well tramped at the sides, and especially at the corners. When full, let it stand four or five days, and put on one foot of straw and trample this well at the sides and corners the second day after it is put on.

Cut the corn one-fourth or three-eighths of an inch long and you will have no trouble with sore mouth in cattle. In feeding, we give cows what they will eat up clean in a half to three-quarters of an hour, which is from three to five pecks per head, according to size of the cow. We mix with each feed of ensilage about four quarts of wheat-bran and one tablespoonful of salt. I think the mixing of great importance, as the grain will be raised and rechewed and the nutriment assimilated instead of wasted. We feed ensilage night and morning, and water at noon; then directly after watering we give each cow about two pounds of clover-hay. We feed our brood mares a pailful each twice a day, and our brood sows one pailful a day to four sows. Before opening our silo we fed clover-hay and corn-fodder, which was cured in the best possible manner for ordinary farming, and cut up as for the silo, with more grain than we feed with ensilage. After we had fed ensilage one week, our Jerseys had gained from 25 to 30 per cent. in quantity of milk, and we think the quality equal to, or superior to, that made on dry food.

What we want to do is to raise more crops to feed more stock to make more manure.

Question: Did you fill as fast as you could, without letting it heat?

Answer: I filled it right up full as fast as I could. If it doesn't heat as fast as I want to fill, I keep it going right up.

Question: Do you fill whether it is wet or dry?

Answer: Last year I put it in very dry, and the year before it was wet, and was just as good as last year. I think the heat will evaporate the water, so that it will make no difference. Some of you make a mistake in regard to the convenience of the silo. My barn is 135 feet long, and I keep 70 odd head in it. The depth of the silo is 28 feet. It is seven feet from the sill to the basement, and seven feet more below; and then I boarded up 14 feet more, making 28 feet in depth. I have a chute that sends the ensilage clear down to the cattle, and we bring it down to feed some sixty cattle.

Question: What do you feed it to, that is, what kind of stock?

Answer: Mr. Root feeds it to everything but his hired girl. It keeps just as well during the summer as in winter, and I found that mine, that I had been feeding until May, was only slightly white on the top.

Question: Is your silo one or two thicknesses of boards?

Answer: Two thicknesses, with tarred paper over them, and matched ceiling. I cut my corn longer than most do. I cut it about one inch long.

Question. You spoke of your ensilage not being covered. Did you discover any of it spoiled?

Answer: I did not; only slightly white on top.

Question: Do you favor tarred paper?

Answer: If the boards are matched inside, I would not care about tarred paper.

President: Gentlemen of the Convention: There is an important point, and one that is just as important as the building of a good, tight silo, and that is the raising of the crop of corn. I wish to make a short statement. I started by sending, for the first bag of ensilage corn, which cost me \$9.25 for a bagful. The land was very poor, and after I began to increase my land, by manure, I made up my mind that I would manure it all, and my experience is simply this: If you get the land up to the proper fertility, you can ripen any corn that is raised in the United States. Develop the southern ensilage corn up to a certain point, and use it for seed next year. Raise this ensilage corn on a piece of land, and then get it seeded down in clover, and run that until the small acreage is brought up by manure, and if you will get your land up to a proper value, you can raise more, and get an extra quality of corn-fodder, and get the same amount of corn.

Question: A good many have got more ensilage than they will be able to use. Can you keep it?

President: I have had some experience in that matter. One year I had some that I let lie in the silo. It turned a dark color on the top, until I got ready to use it, and, to my surprise, when I got in to look at it, I found it just as good as any, and I fed it to my stock.

President: I understand that the majority are in favor of lath and plastering.

Motion by D. E. Childs, that the sense of the meeting be taken by a vote to ascertain the preference of the members for the different kinds of silo.

President: All you gentlemen that are in favor of building a silo, according to Mr. Talcot's views, please rise.

The Chair announced seven votes.

Those in favor of double boarding, lath and plastering, rise.

Majority declared in favor of lath and plastering.

All in favor of double boarding and tarred paper.

Two votes announced.

Those in favor of concrete silo. No vote announced.

Mr. Breck: Mr. Chairman: The young man that starts out to pick a wife must make his own selection. So it is in building a silo. Each man must make his selection according to the circumstances. Whether he shall have concrete or tarred paper; whether double boards outside or inside; he can select just as he has a mind to. If he has a sawmill, or

has the means to buy the lumber, he can buy flooring or what he wants. If he has no room in the barn, or wants a silo nineteen feet high and no wall, let him build it. If he wants to know what thickness he should build, and whether the ensilage in such a silo would be injured by the frost, that is a puzzler. The perfectly dry silo is what we want. If he will build his silo in a dry place, and wants to get rid of the stones on his farm, let him make a foundation of them, and take them off the fields. This will insure him a foundation dry and solid, with the use of cement for the bottom.

President calls on Mr. Ford, of Ravenna.

Mr. Ford said: Mr. President and Gentlemen: I feel that after hearing what I have to-day, and not being present yesterday, that I ought not to occupy much time, but from what experience I have had, I would say something as to the matter of building a silo, and would say, build it as best you can. It makes but little difference what you build it of. I voted for two thicknesses of boards because I have just such a silo. From all I had read about the matter for some time, and visiting those who had silos, and after talking with John Gould on the subject, I considered that the best plan; so I built it with two thicknesses of oak boards. Some said "they will warp," but there is just one board warped, and it does not hurt it. I don't agree with some as to the results of ensilage. I don't think it produces quite as large results as some claim it does. This season I had good corn-fodder, and perhaps right here I might say, that I am in favor of feeding good feed, and I think that when cows have good corn-fodder and meal, that they are well fed. So when I was feeding, I gave them a good ration of half-and-half bran mixed with chop, then all the corn-fodder they will eat; or it was my intention to give them all they would eat, and our women folks thought when we began to feed them ensilage that they did not get as much milk as they did when we were feeding chop, and that the ensilage made a poorer material. The cattle have eaten the ensilage well, and it keeps them in good condition. However, if I could keep the corn-fodder in as good condition through the winter, and in as good and bright condition, I would never build a silo. But that cannot be done, and the question is, what is the next best thing to be done. It is to put it into the silo, and your work is done. The fodder may be frozen, or the field may be muddy, perhaps, and it is difficult to have it in condition that the cattle will eat it all, and there is a great waste. In this, there is a great advantage in the silo. Now I have a word about planting and the quantity to put on the ground. I would say plant pretty thin, so that your corn will ear well, say in rows with kernels four inches apart, or so that your stalks will be well separated in the rows, and you will raise more corn than to have it thicker in the row. Some-

thing was said about the varieties of corn. I experimented some on that last season, and I will say that my candid belief is that the large sweet corn is better for ensilage than any other variety. I don't agree with the President in one thing; that is in regard to the ripening of the southern corn. I can not agree because ours showed different. We got on the large sweet corn, large ears, ten inches long and two and a half inches through, and it needed more power than I had to cut it, and we had to stop occasionally. On the southern corn we only got a little scrub-sized ear. The idea is to make your ground rich. Don't go over too much ground with your fertilizers, and don't spread it too thin, what ever kind you use. Till it right up to the handle, and you will find it pays better. Just as in raising potatoes. If you can raise as many bushels on half an acre well-tilled as you could before on two acres, there is three times the profit; so it is in anything else that you have to do.

Question: What kind of oak boards did you use for silo?

Answer: They were every kind, and cost me eight dollars a thousand. We selected straight edged-lumber. I will state a little more fully in regard to the building of my silo. I built it in the barn. We run the silo clear down, eight feet from the floor, and it extends thirteen feet above the floor, so that it is twenty-one feet deep. We put in 2x4 studding, setting them thickly, but the beam running round at the height of eight feet, there was a support for the studding. We put the first boards on cross-wise, then tarred paper, and the next boards up and down, and then put the ensilage in the pit; and there was very little mouldy ensilage. I would fill differently from last year, and would fill the silo as fast as I could. I would prefer to have the ensilage free from water, and I wouldn't care if it had been cut a week before I put it in the silo.

Chairman: The trouble with the southern corn is, it is late enough to cut it any time. I have planted as early as the 26th of April, and not later than the 10th of May, and I don't care if the frost does strike it.

Mr. Beckwith: I am very much pleased with the plan suggested, but I am not quite satisfied with the bottom of the silo he describes. I was not here yesterday, and consequently did not hear all that was said on that subject, but if he levels the bottom over and cements it an inch thick, it would not be enough. We dug down six inches in making the bottom of our silo, and pounded small stones in solid, and then thoroughly covered that with Portland cement, so that we had a good and durable bottom. Then my studding were 2x12 and I cemented the corners, where the laths were joined in the corners. The silo bulged out with the pressure somewhat in the center, and to remedy this I had carpenters put iron bars around the center, and it has proved a success. I would like to ask the speaker at what temperature he covers his ensilage when the pit is full.

Mr. Rice: I do not know the temperature. I let it stand two or three days, first, and then put on about a foot of straw, and, after that had lain two days, tamped it down tight and solid. When we opened it, we found it the same as when put in, except two or three inches on top, which was a little darker. The ensilage out of a pit, built in the way I have described, will be found to be the nearest sweet ensilage that you have seen.

Mr. Beckwith: I did not hear the description, as I was not present, and did not hear as to the amount of heat in filling.

Mr. Rice: I said that in filling it heated to 125 degrees.

W. N. Lawrence: If you will read the *Ohio Farmer* you will get the whole business.

Question: Did you ever test the ensilage, to know whether it would injure your cows or not?

Answer: I have not. They have all they can eat of it, and have seen no bad results.

Question: If you had no barn suitable, how would you build a silo?

Answer: Build it just as my friend has described; I would build a stone wall, two and a half feet high; then build the frame with 2 x 10 studding, and 18 feet high. There would be no springing or spreading of the building.

Question: Would you put up a partition, in a 14-foot silo, for feeding 12 cows?

Answer: If I could change the shape of the 14-foot silo, to something like 10 x 16, it would suit me better. Where you have your silo so narrow, there is more friction, and if you tamp it down well, there is no settling in a pit 12 feet high, of that width, and a foot will cover all the settling.

Question: G. L. Barber, Richland county: If you plaster the inside of your silo, when you have taken the ensilage out of the pit, it must leave it wet, and does not the plaster spall off?

Answer: I never saw it spall off.

Chairman: One of the questioners states that he has tried it once, and it was an entire failure. If there be any others that have had failures in any way, it would doubtless be more profitable to state them, than to speak of the success they have had.

Mr. Easthope, of Niles, Ohio, called by the Chair, to speak in regard to his construction of a silo.

Mr. Easthope: I would much rather sit, as a member, as one of the congregation, but as I am called to speak of the method of building a silo, I will make a brief statement. I think the gentleman who made the motion to vote on the different methods of building silos was a little premature, and that we had better wait awhile, until we have more silos. I will

now make a statement of my silo as built by myself, and probably that will give you some idea of it. I will say that I have had no trouble in regard to spreading out at the center. My silo is built 48 x 19 feet, 16 feet high. It is framed just as you would frame a barn. The sills are 8 x 10; corner posts 10 x 10. I have two partitions in the silo, making three apartments, of 16 x 19, with studding across, which is 2 x 10. Right in the center, about 9 feet from the bottom, an inch bolt runs through. The frame made in this way can be made very cheap. A good deal has been said about 2 x 4 studding, toe-nailing, etc., but I can not see the utility of that kind of building. A good mechanic will not build in this way, and you want to get a good carpenter, and have him mortise the frame, and you will have a much better and more satisfactory building. While my means may be a little better than some, and I own a large barn, probably 110 feet long, yet I do not think the silo in the barn is advisable, even if built at less cost. My silo was built at a cost of \$550, and has a capacity in the neighborhood of 350 tons, and it is generally conceded that it was built very cheap. I laid out every line that was laid out myself, and desired to make so permanent a building that it would not spread out by lateral pressure. It has not spread out a particle, and as I put in three to four hundred tons, there would be considerable pressure. The frame of my silo is a well-built frame. My studding is 10 x 12, and the corner posts something like 15 x 17 in the clear. So you see those posts help to strengthen the building against lateral pressure. I would say, if you are going to build a silo, be sure and have it strong, and do not use 2 x 4 or 2 x 6 studding, for if you do you will make a grand mistake. We have had the silo illustrated in our papers, and every information as to how to construct a good substantial silo. The statement was made in the *Ohio Farmer*, and the *Pittsburgh National Stockman*, as to the best methods of building one, and yet we all come here wanting to know how to build a silo. The lining of a silo is an important factor, and while I do not see where I can better the one I own (I used cheap boards, having them the right length for the studding, and used common building paper), I think I would prefer one thickness of boards, though I have two boards, between which is the covering of brown building paper. I think it is almost useless to put the paper there, though it may protect the silo from frost. If I was going to build again, I think I should have the paper on top of the boards, and put a 2 x $\frac{3}{4}$ strip over the paper, at the proper distance for the lathing. This would give somewhat of an air-space. I never had any difficulty with plaster falling off, or spalling, and you cannot find five pounds of ensilage on the sides of the pit. Whether it is from the effect of our putting in the ensilage, and tramping every other load, I cannot say; or whether my plas-

tering is so good that the air cannot get in. I think I have the finest ensilage in the country. I traveled a good deal before I put a dollar in my silo, to learn how to construct a silo, and now I have a good and substantial silo, that matches with my large barn. I did not expect to read any paper in regard to ensilage, yet I want to make a few remarks as to the effect of ensilage, and its value for feeding, to me personally. Gentlemen, I am feeding 85 cattle and horses, or, probably, 90 head in all, and every one is fed with ensilage, with a certain amount of mill feed, and all are doing well.

When the silo is emptied and the walls are stained with the juices, they can be very much improved in appearance by whitewashing, and I would suggest that you do this along in the fall when you are likely to have visitors to examine your silos.

Question: How far apart did you set your studding in your silo?

Answer: They were 16 inches apart, which would make the distance just right for lathing.

Question: What is the condition of your silo as compared with the time of its erection?

Answer: It is as sound now as it was four years ago.

Question by Mr. Root: As to the location of a silo in a hay mow.

Rice: I would place it at the end of the hay mow most suitable for feeding, and use the balance of the bay for hay. It can be arranged convenient to the stables, and we think the balance will hold all the hay needed for feed with the addition of the ensilage.

Question: Do you feed ensilage to cows fully up to the time of calving?

Answer: I feed ensilage up to the time of calving. I think there is nothing better for them. We feed our cows immediately after milking, and milk about half-past five or six o'clock.

Question: What arrangement have you for the hauling of your corn when filling?

Answer: I have hauled on the wagon, but prefer to use a sled, as it is so much easier to load than on a wagon. I have a piece of plank extending from the back of the sled to the ground, on which I nail, so that the men can walk from the ground onto the sled in loading, and begin to load at the front end of the sled.

Question: Is there any objection to rodding the silo to prevent its spreading in the center?

Answer: Where the door opens from the center of the pit to the feeding alley, it weakens the partition, and an iron bolt running through the center would strengthen it.

President: If there are any persons here having samples of ensilage that have not been presented, let us have them.

Talcott: All these different silos produced good ensilage, and each man gives his reasons for building his silo in his way, according to the expense and his ability; one builds in one way and another in another, and there isn't a failure reported whether built of concrete, stone or boards, and plaster or of wood. Therefore, look this matter over candidly and give your opinion to the committee. In building your own silos, you have got to exercise judgment, and build as suits your own condition. When we go home, we want to tell the people what the sense of this meeting is, but it is not obligatory, and each must use his own judgment.

President: Mr. Talcott is right; give me the man that has a judgment of his own; if he has none, this convention cannot furnish him one.

ADDRESS OF H. TALCOTT, JEFFERSON, O.

Mr. Chairman and Citizens:

I am glad to see this interest manifested by so large a number of the best farmers of Ohio in the success of the modern silo. I did not expect to see any such an attendance as I have seen here to-day, and it is very gratifying to know that such a sentiment is being built up as we see here in this meeting, and as I look over the audience and see the bright, intelligent faces, I feel sure that those who have left their homes, are the ones who will get a benefit here, by their intercourse with others. Many having some knowledge of the silo, will find others who have more. There are many who will never receive the benefits of this movement until some of their neighbors build a silo, and then they will see its advantages. It is but a few years ago that I shared the belief with many others that ensilage and the silo were a rich man's foolishness, but from investigation some eight or ten years ago, I formed the belief that it would some day come to the front in a practical manner, and would then become of general adoption. So firm were my convictions, that I took considerable pains to visit some of the first ones made in the United States, but in every instance, the great expense of the heavy, solid masonry, deep-pit silo, with all the attendant necessities that scientific men said must be observed, compelled me to banish the thought of ownership of a silo. But science commits such frequent blunders, and is one of the greatest stumbling blocks to progression oftentimes, that I kept up a continual thought of the silo, hoping that the supposed necessary terrible expense could in some way be obviated. Time and the experimentation of men with more sand than myself, so quickly proved the cheap wooden silo to be a success, that I am happy to be not only the owner of silos, but a very enthusiastic believer in their efficacy and worth. I believe that science yet imposes too many obstacles on the business, which deters many farmers from availing themselves of the benefits of the silo. I hope to see them melt away at this meeting like the whitest frost before the mid-day sun, and greatly desire to see many men go from this convention to their homes and be venturesome enough to build cheap wooden silos, discarding all "fuss and feather" notions about its style, or the manner of using them, and come squarely down to the cheapest and best air-tight silo that can be made of wood. First, in its construction, let me advise you to use only one thickness of inch boards as ceiling for the silo pit, because two thicknesses of boards or more, with or without paper between them, will retain moisture for a long time after the pit is emptied, and no amount of logic, argument or prayer can pos-

sibly prevent decay or slow combustion of the wood, if subjected to this treatment. A single thickness of boards, if smoothly planed matched narrow ceiling, none of it over four inches wide, will never shrink from its matching when empty, in hot weather or cold. As soon as wet ensilage is stored in such a pit, it will swell and close up as perfectly airtight as any silo ever made.

It is the same in principle as a cask to hold liquids. Who among you would contend for a moment that there would be greater efficiency in a barrel to have two thicknesses of staves? What different in principle can a silo be from a barrel? Frost is no consideration; it is not to be guarded against. Even if two thicknesses of boards with lapped joints can be made cheaper than a single thickness of planed and matched ceiling, the double boarding should not be adopted, because of its early decay. I say planed and matched, because the pit needs a smooth side for the ensilage to slip down easily. The saccharine matter in ensilage stalks forms so sticky a substance that it will hold finely cut ensilage to the side of a rough board pit, like the paper coating of a wall in our houses. I think some of the failures from ensilage moulding around the outside of the pits, resulted from the rough board sides with their uneven surface, that prevented the perfect settling of the ensilage at the outside edges, or near the boards. It is a mistake to fill the space between the inside ceiling of a silo and the outside covering of the barn or pit with sawdust, straw, leaves or earth, thinking to guard better against frost. I said that you should use narrow ceiling, not over four inches. If you use a double board ceiling there is just as much danger of the ceiling springing or puffing up as there is in the single ceiling. Before it is put together, say that it did spring up or fail to be perfectly tight, it would be the same in double as in single board ceiling. The lumber should not be too highly seasoned. If you were to make staves of lumber too well seasoned and make a barrel and fill it with liquid, it would surely burst the hoops. Lumber sawed, say this winter, by May or June is in its most perfect form and best condition to make a silo. When you put your ensilage in the pit it will be perfectly watertight as soon as you fill it, and will never swell and burst. In the stone silo the heat of the ensilage is largely absorbed by the walls, and some ensilage will spoil near the walls and at the sides. This is not the case with the wooden silo. If you will take a thermometer close to your wall you will find it will be considerably colder than at the center, but with the wooden silo there is but little difference. I think Mr. Bullard has been experimenting on this point. The lateral pressure you have heard spoken of today is not very great; no such pressure as from a bin of grain, because the ensilage sticks together tightly and does not move sideways very much, but seemingly does nothing except to shrink down and out of sight. It does not require very heavy girding or studding for a silo pit. For a pit up to twenty feet, 2x8 or 2x10 inches, of the same width as the beams or post of the outside barn or silo should be used, but I find 2x4-inch abundantly strong for a partition between silo pits. The 2x4 studding is abundantly strong when put in properly, where they are not over twelve to fifteen feet high. I occasionally find a failure where the pit is twenty-eight feet high, by not having the partitions properly put in. The partition should be put in and fastened in the construction of the silo, and should extend through to the outside of the studding, and then there will be no danger of the silo spreading. You can put in a moulding in the corner, but if the partition is put in well spiked your silo will never draw apart, unless it is very large. In a larger silo 2x8 or 2x10 studding is sufficient. Perpendicular ceiling is a little the best, and should be used when convenient, in my judgment. Still I have two pits doing good work with horizontal ceiling. I see, also, in Mr. Brooks' silo, the pits are mostly, if not all, ceiled horizontally. I make it a rule to do good work, but do it easily if possible. The floor of a silo pit must be made according to the surrounding circumstances. On a sandy, gravelly soil, where moisture never enters, no expense whatever need be made in the construction of the floor. Let the ceiling boards run down to the ground and all is well, but on a clay soil water will raise up through and do much damage, in spite of all your wishes to the contrary. Hence this kind of bottom demands a water-tight cement floor like a cistern. Of course some moisture will then go through

this floor, as it will through a stone wall or concrete silo, and will spoil a little ensilage at the sides, but it is not of much account, provided other things are properly done. Early writers did not consider the item of moisture, and therefore advised solid masonry of stone or concrete. If a silo is made in the second story of a barn, extra heavy joists and underpinning are necessary. I have two built in the second story of a stone basement barn. A single thickness of one-inch planed and matched flooring, like that used for the side ceiling of the pits, is all that is necessary or desirable for these. I say single flooring and single ceiling, for the reason that as soon as the pit is empty it will dry out and there is no decay of the wood. It will last for a great many years. I have not the least doubt that a silo built in this way will last twenty years. But if you have two thicknesses of boards you will have decay, and if you fill the space between the boards with sawdust it will not last five years. In my floors, when the silo is emptied, it is not more than two or three days until it dries right out, and that lumber is just as sound as it was in 1885, when first put in the pits, and the top part of the pits where the ensilage is put in are just as perfect as the day they were built. If you build in the second story of the barn, of course you must take extra pains to make the foundation strong. I could not afford to waste the basement, as I needed it for stabling. My joists were 2x10 and 20 inches from center to center, and that was abundantly strong in the barn, but I put an extra joist in the middle and two rows of bridging, and then set six posts on each side of the foundation. It is a clay soil under, and I wanted to keep down moisture, and laid four inches of cement, then put a 6x10 timber on that and then set my posts on that and the partitions are over my horse stalls, and I have not discovered the least settling or spreading, and I have filled them four times, putting a little over a hundred tons. I have spoken of this because I have had to answer questions about silos built in second stories, and I thought it would be of interest. I prefer, however, to build the silo from the ground up, and to have one side of them come to the feed alley of my stables, so that the ensilage can be raked off the top of the pit at every feeding when used, and fall at the foot of the pit into the feed alley, where most convenient to rehandle for the stock. The feed doors for the silo should be slip doors, one above the other. I find that sections or pieces two feet wide and four feet high are the most convenient, so that the pieces can be taken out. Be careful not to make the pits too small or too narrow, because friction of the ensilage on the sides of the pits prevents their settling in the best manner. The pits being made, the most important question then is, what ensilage crop will produce best results for the least money. So many questions have been asked about the floor of the pit that I will speak a little further of that. If you build a pit where you have a stone wall or concrete for the foundation, if you build a wooden silo, let your partition be thick enough so that a two-inch strip can go inside of the wall down to the cement bottom, so that when you come to the ceiling it will leave an air chamber clear to the bottom, then you will avoid the moulding of the ensilage, and it will not waste any, except, possibly, a little at the bottom.

In Ohio there is no doubt that the southern white corn, grown to as near full maturity as can be done in this climate, will produce the most feed per acre, and cost the least money per ton. This crop, for feeding after the first of October, each year, is almost perfection. It ought never to be cut for feeding purposes while in an immature condition. The corn plant, either field corn, sweet corn, or any of the varieties of the southern or western corn, or amber cane, does not become perfect for feed, until near maturity of the seed or ear of corn that grows upon it, and, for that matter, no other corn. We found this in the use of sorghum in our manufactory, and have used sweet corn, white, western, and amber cane, in their particular seasons. In our work we used all of these kinds, commencing on the earliest varieties of the sweet corn, the Egyptian sweet corn, western and southern, and, last, the amber cane, lengthening our seasons, from the first week of September, to November or December, we would have eight or ten weeks' work in these various stages of the plant, and we could not get anything but glucose from the stocks. The sugar would not mature until near the time that the ear of the plant would mature, and we never could get the best product until it was about in that condition. When it gets

into the milk stage is when you will get the greatest development of saccharine matter, and at that point is the proper time to cut it, and lay it on piles, ready to be put in the silo. You never can develop so much goodness as at that point. If you let it stand longer, as my friend Mr. Beck says he is going to do, you will find that you will lose a part of the substance. It will mature the grain, but you will find that when you bring the grain to full maturity you have ruined the stalk. It is a woody, fibrous substance, and it is worth very little for ensilage. You will find the seed has taken away the feed value of the stock, and you have lost it. In our experimentation we found these facts. Furthermore, there are a good many who have the idea that frost will ruin the ensilage. A slight frost may kill the blades, but it does not injure the ensilage very materially. The great stalks are like the bees that gather the honey. They gather the honey from the atmosphere and store it up in the stalks. If you will make a careful analytical test of the blade, in the morning, you will find but little saccharine matter in it. At six o'clock, there is a great deal more. That is taken up by the stalk at night. It is important that the suckers that grow on the corn should be removed, as they injure the feed value of the corn. Anything that will not mature the saccharine matter is a failure, and there is but little nutriment in it. If you are foolish enough to cut before maturity, you will be surprised to see what an amount you can feed, and with what poor results, because you don't let it develop and grow to maturity, and you will never find a stock of matured corn, where it fails to produce an ear, that will ever yield very much syrup. In the order of feeding, after the first of October, the southern corn is almost in perfection. To feed in July, August, and early September, as many dairymen do, to force an extra flow of milk, or produce extra cream, is very wasteful and thoughtless management. The farmer has given the use of his land, seed and cultivation, and then to throw it away while in this weak, washy condition, when the possible nutriment of the plant is only partially developed, shows that he needs a guardian, for lack of common sense. The best ensilage crop, for early feeding, is clover, which is always at its best the last week of June, a few days before it is ever needed to supply a failure of pasture. This should fill the silos first, and then be fed freely, as needed, up to October first. Then fill, the second time, with ensilage corn, as the main fodder crop of the farm. Many farmers make a great mistake in sowing ensilage corn too thick. Ohio soil is good, and nearly even, all over the State. The Lord intended her for the pattern State, or he would not have granted every element needed for the best development of agriculture in such equal profusion. We have everything, almost, within our borders that appetite can crave and heart desire. The soil will produce the best and sweetest corn ensilage by planting in drills three or three and one-half feet apart, and kernels eight inches apart in the row. If three-fourths of the seed comes up, you can grow from fifteen to twenty-five tons of the green fodder per acre, which will have from seventy-five to one hundred and fifty bushels of great, large ears of white corn, nearly ripe, or in best roasting-ear condition. This amount of grain, cut up with the ensilage, forms the best balanced food ration for stock I ever fed to cattle, and at the lowest cost. There is no expense for husking, cribbing or grinding. I paid for husking 874 bushels of corn, four cents a bushel, or \$35.00, and for getting it in order to be consumed, another four cents, that is, \$35.00 more. I could have put that in the silo for less money than I paid for either the husking or the grinding, and it would have made as much milk and butter, and I think more. I did not have a silo to put it in, or I should have done so. It is fully four quarts of corn, in the ear to each bushel of the ensilage. I never should have known this if I had not had a bull that was tickled to death with the feed, and I would find from three to four quarts of this corn every feed left in his manger. Then I thought I would see how much corn there was, and I had three baskets filled, and found there was from three and one-half to four quarts in every feed. I have not fed anything else to the milk cows excepting the ensilage, because I think it enough, and they have done splendidly.

Question: Was that shelled corn?

Answer: No, it was cob and all. It kept moist, and they eat it all.

There is a check-row planter that plants one or two kernels from twelve to fifteen inches apart, which gives just about the same amount of seed, about four or five quarts to the acre, but thicker or over-seeding spoils or wastes the seed, and also the crop. There is little doubt that very much of the sour ensilage of which we hear so much complaint, is because it was raised sour, and never had a chance to sweeten or develop saccharine matter in the plant. It must have space, sunlight, air and warmth, to make sugar, or any approach to it. Next comes the filling. Please do not be frightened over this. If you have little help, do slow filling the Lord will take good care of both you and the ensilage, and it will come out all right in the winter or spring, providing the ensilage is grown to perfection, as it should be before harvesting it. If you have plenty of help, and can rush it in faster and cheaper per ton, go ahead and feel secure; all will come out well. If you strike pleasant weather, when men and teams can work pleasantly, be thankful for it, but put it in as fast as you can, all the same. If, when you plan to do the work it is rainy and bad weather, never mind; go ahead, you would not do anything otherwise; only go up town and spend money. Stick to your work and fill the silo; it will come out all right every time, providing the crop, as I said before, is fully matured. I have tried it in every shape with good results, and know you can all do the same. Another use for the cheap silo when built upon the ground floor, is to put a gas-pipe outlet from the center of the pit in the bottom; cork it up tight when used for ensilage, but when emptied in the early winter, then fill and use it for an ice house. Many of our dairymen who are now furnishing cream to creameries will find the silo answers a double purpose, and it is always emptied of ice by the time it is needed for ensilage in the fall. With prudent management upon a farm it is possible to keep at least one good animal the year round on two acres of land, or a little less, which means twice the number that now feed on our farms in Ohio. Are you afraid of over-production, or will you longer neglect your opportunities, or are you too dull and stupid to catch on to the car of progress and take a ride with those that win? If not, attention, fall in, march; build the silos; grow the crops; fill first with clover; second, with corn ensilage; third, with ice, and at the end of the season deposit the extra money in bank, and the front side of your face will not have material enough in it to make the broad grin your heart will greatly desire.

Mr. Bird asks his plan of cutting ensilage corn in the fall.

Answer: As soon as my ensilage corn gets to the best condition—which I learned by my experience in the sugar factory, is when the corn begins to dent—I set men enough to work to cut it and lay it on piles, and let it lie three or four days in piles on the ground, laying six or seven

rows in the piles, convenient for the teams to drive between. I do not get through until some time in October. If I have ten or twelve acres to cut, it is a great deal of work to cut and lay it in piles. The women folks object to more work than is necessary, and if you have two or three hundred tons of ensilage, you want as little extra work as possible. Cutting and leaving it lie in this condition, you waste nothing. It lies there all right until you are through cutting. Then let your teams drive between these piles of cut ensilage corn, and two men in the fields can load, and you can load fast enough to keep three teams on the road. Then have three men filling the pits. For this reason I think it is best to cut the corn in advance in the fall, otherwise the men at the pit will be idle while the corn is being cut and drawn to the pit.

Question: I have been troubled with mould on the sides of my pit. What is the cause?

Answer: Probably for want of proper packing to exclude the air.

Question: Have you ever used the Southern corn, and can the ears be plucked from the stalks in the green state and the stalks ensiloeed and save the corn also?

Answer: Certainly, if the corn is sufficiently ripe.

Question: Another is troubled with mould on the sides of pit. The pit is lined with boards planed and matched. What is the matter?

Answer: The failure may have been in the ensilage, and perhaps it might have been packed too hard or too little. My experience in treading it in was, that I packed it too hard. The first year I put three men in the pits to tread it down, and did not think that I got a fair result for the three men's work. The next year I put two men in to tread, and when I came to the pit I found them wrestling instead of treading. The last two fillings I only put one in to tread, and then only a boy. I had him tread around the sides and corners, and don't waste any more money in treading.

Question: Have been troubled by ensilage sticking to the sides of the pit in settling, causing it to mould. What is the remedy?

Answer: I scarcely know how to answer the question properly. There will be a little that will stick to the side and will not settle, and will leave a hollow where it will mould. When it is packed tight there may still be a little, but not so much as in the concrete pit. It will cook and be hot until it is fed, and it don't seem to hurt it any. I do not see but it is good, and the cattle will eat it all.

Question: Is there any difference in the feeding value of sweet corn and field corn?

Answer: Yes; the Egyptian sweet corn is better than the field corn. As compared with Amber cane we found that the yield of field corn was

about one-half and Egyptian sweet corn about three-fourths. We have tested the different corn in our sugar factory, both as to quantity and quality.

Question: How do you set the studding in building your silos?

Answer: I set them just as I would in building a house. They should be set perpendicularly, for if not, in settling it may form an air-chamber, and thus spoil the ensilage. I put my studding 16 inches apart. It would be a good idea to bridge the studding, the same as for a floor. It would make it stiffer.

Question: Will not the corn heat, lying in piles, so as to injure it?

Answer: No, it will not heat to injure it.

Question: How long can you leave your single-board silo empty?

Answer: Just as long as you wish.

Question: Will the boards not shrink when empty?

Answer: Yes, to some extent; but I have seen double boarding in silos shrink just as much. You must be careful not to have your boards too wide.

Question: What do you call too wide?

Answer: What do you call too wide?

Answer: The boards should not be over four inches wide.

Question: Have you ever tried rye for ensilage?

Answer: No; nor in any other shape.

Question: How much sweet corn have you used for ensilage?

Answer: I have not used it, except what I planted for garden purposes. What was left was put in the silo.

Question: How does it compare with the B. & W. variety?

Answer: It is of superior quality, if the yield was the same, but have not experimented with it. The Southern, the Egyptian, or any other variety is good, if put in in proper order.

Question: I cut my ensilage corn and set it in shocks of about half a ton each, cutting it when the corn was in good roasting-ear, and let it remain in these shocks, and when I put it in the silo, found it would not heat above 110 degrees, and found dry fodder, cut and crushed, is preferable for feed.

Answer: It was a great mistake to put it up in shocks and allow the air to dry it out, and to expose it to the moisture and the atmosphere, and you wasted very much of the ensilage by doing this.

Question: My field corn was entirely ripe, and instead of husking, cut most of it into the silo, and about four feet on each side of the pit was dry, brown and worthless. The pits were covered with sawdust.

Answer: I do not think you got your ensilage properly packed, and that is the reason you did not have a good result.

Question: When is the best time to cut clover?

Answer: When it is in the best condition for hay. When the best development of saccharine matter is in the plant, then cut it and put it in the pit. It is good for every animal on the farm, and is not expensive.

Question: Do you advise running it through the cutter?

Answer: Yes. Professor Henry and others have claimed to get good results without, but I have never seen good results except by cutting. Mr. Thomas Erbe, one of the best of farmers, has tried it to a large extent, but without satisfactory results, but when cut and in good condition, the best of results.

Question: Do you tramp the clover?

Answer: I do not tramp it any more than to just keep it level. You should begin to put it in early. You do not want to wait until the grasshoppers have got everything before you begin to feed it, but you want to commence to feed it as soon as the rain stops, and you also should feed it in fly-time, in the warm weather, and turn the stock out at night. Ensilage should be your main feed in the day-time, and turn them out at night. In the fall you want to reverse the order, turning them out in the day and feeding ensilage night and morning.

Question: Supposing you need this feed for the winter?

Answer: You won't have any trouble if you have plenty of good silo pits; the trouble will be to get enough stock to eat the ensilage. I used to have six or eight head of cows, and now have forty.

Question: Is stock liable to get colic when fed on ensilage first?

Answer: Yes; if you commence too rashly and give too much. When you commence, feed a little at first until they get used to it, and then you can feed them a bushel, or all they want.

Question: Is it safe to feed it to mares with foal?

Answer: Yes; I have two that I have fed with good results.

Question: What is the cost of a feed elevator?

Answer: The machine men would kill me if I would tell you.

Question: Did you ever have any clover ensilage that was mouldy or sticky?

Answer: Never, where it was kept in a full pit. I never kept clover ensilage long enough for it to get mouldy, but commence to feed it out at once. There has been some talk about clover ensilage getting pasty, but I have not had any experience with it.

Question: Have you ever used oat straw for ensilage?

Answer: I have never used it.

Question: Can a silo ten or twelve feet square be fed out fast enough to keep it in good condition by feeding three cows and four horses?

Answer: No, sir; not unless you have more than one pit.

Question: What kind of lumber is your silo lined up with?

Answer: Every kind I had in the yard that I could not sell. We sell lumber, and do just like the farmers, who sell what they can and eat the balance.

Question: What is the best time for cutting clover for ensilage?

Answer: Cut it when it would be best for hay. Cut it when the blossom is fully developed, before it is dry or dead. You want to cut it when it is coming to maturity, rather than when it is past its best; at the stage when there is most nutrition and sweetness in it.

Question: Is it necessary to cover the clover after it is in the pits?

Answer: Yes; it should be covered. I waited two weeks before I began to feed mine. You need not wait two weeks; you will lose a little, but there will not be much waste. There may be a little that is moldy, but, as I told some of you to-day, I threw that off. It looked too much like bogus butter.

Question: What do you feed it for—for milk or butter?

Answer: I feed for both. I know of a wooden silo built with horizontal studding and grooved boards, and the gentleman that built it took boiling hot coal-tar and with a swab, on the dressed surface, gave it a thorough coating. It penetrated the wood and made it more durable and impenetrable to the juices of the ensilage and kept out the air and made the temperature much more nearly the same at the edge and inner part of the pit. I think that a great advantage. In that silo, which has been in use for three years, the ensilage, where it came in contact with the surface, is about as good as in the interior of the pit. It keeps out the oxygen, and the heat has been nearly as great at the outer as the inner part, if it is properly tramped down.

Question: How does the mangel-wurzel compare with corn as a feed?

Answer: I have never fed any, but I received a letter from a producer of both cheese and butter, who states that he never found any bad effect from this feed on the milk or cream. He says, "I have taken the same amount of milk from cows fed on mangel-wurzel and other feed, and kept them separate, or kept the curd separate, and found as perfect cheese from that fed on mangel-wurzel as any, and therefore considered that it was good for quantity and for quality." Said he would endorse the putting of coal-tar on the boards in the pit. It becomes hard, and the juices do not affect it.

C. K. Mackabee advised putting one-fourth rosin with the coal-tar, and said any one using matched lumber need have no fears of the boards swelling.

The Chair: Mr. Breck will answer the question in regard to use of rye for ensilage.

Mr. Breck: I will say that I used it once, but I will never use it again as an ensilage. I sowed several acres of rye. I cut it half an inch long and served it just as corn-fodder, and the cattle wouldn't eat it. They wouldn't even smell it, and I had to carry it out and throw it away. I think, perhaps, I cut it too green. I cut it half an inch long, and the pieces were like pieces of tubing, and would not press together, and I think that is the reason it was not a success. I cannot account for it in any other way.

W. H. Javey: Why is it that so many siloists differ in some particular point, and show the defects of others, and still all report good results?

Answer: It is just like it is with religion; it don't make any difference how you get it; either religion or ensilage is good, if you only get it sure.

ECONOMY AND PROFIT IN THE USE OF ENSILAGE.

BY A. S. EMERY, NEWBURG, OHIO.

I produced milk for two years by cutting up dry fodder, using the Dick cutter and splitter; stock consuming all the fodder by mixing one feed in advance, and using hot water for mixing. I found that with the amount of mill-feed it was necessary to consume to get a fair flow of milk, I had a very small balance left for my expense and trouble. So in the spring of 1885 I decided to build a silo, notwithstanding the objections against its use. I built a 40x40-foot wing to my barn, and of this space I took 18x40-feet for a silo. The silo is a timber frame of 2x12-inch joists 20 feet long. The outside wall is covered with drop siding and the inside with inch boards. The space is filled in with saw-dust. The exterior is divided off into three pits, 12½x15½ feet. The sides of the silo were then stripped up, lathed and plastered, using water-lime cement plaster, using for last coat pure water-lime. The silo has doors out of which to throw the ensilage, to save hoisting, and which the past winter I found of great advantage. The bottom of the silo is on a level with the floor of stables, which again was of great benefit in feeding. The spring being very wet, I did not get my corn planted until June 10. I used a two-horse planter, planting thirty-nine inches apart, about sixteen quarts "B. & W." corn per acre. The ground kept so wet I could cultivate little, except going through with a shovel-plow to choke the weeds. The corn grew very rank and tall, was well eared, and had very heavy foliage. We began filling the silo October 9, and concluded to put in my field corn; also some from a field of my brother's that had been cut up and shocked about four weeks. I let the ensilage corn lie and wilt three or four days before putting it into the silo. In filling I alternated field corn with ensilage corn. Having three pits, we cut into one, then another, leaving each to heat to 120° to 130°. We filled the silo in eleven days, then covered with six or seven inches of uncut straw, double boarded with inch boards, breaking joints, and weighted with about three cords of stove-wood to each pit, which proved sufficient. We opened the silo in three weeks, found the ensilage with a little dry mould on top, and the temperature at 90°.

I fed light at first, but increased to a bushel twice a day, and reduced the grain ration to half of what I had been feeding with dry, cut fodder. For the noon ration I fed clover-hay. In the first seven days the milk flow increased fifty-six gallons from

twenty-six cows, or over two gallons to a cow, which made a gain of over \$1 per day. They kept up a regular flow, while before they were gradually shrinking about three gallons per week. My stock came out in the spring better than any previous spring, and with a saving of mill-feed, and increase of milk, amounting to about \$600, from November 1st to May 1st. The ensilage was so sweet that a gentleman from Williams county, when examining it, asked if I mixed sirup with it when filling. The cost of filling was sixty-five cents per ton. In 1886 I planted twelve quarts of seed to the acre, May 22d; commenced cutting October 5th, and finished the 14th. I used muck for weight, one yard to each pit. My ensilage was first-class, and the milk was sold to the average of \$90 per cow. The average price of milk for the year was eleven cents per gallon of eight and a half pounds. In 1887, I planted eight quarts of corn per acre; result about the same. I used a tank heater for warming water for stock that season, and found it increased the flow of milk fully 10 per cent. I heated to 70° in the coldest weather.

In 1888, I planted Tennessee corn, early in May. It came on very wet, and corn grew very rank in the early part of the season, then it came on dry, and by the middle of August the foliage of the fodder, half way up the stock, was perfectly dead. September 27th, I got ready to cut corn, but heavy rains began, and before I had much cut a hard frost came, making the rest of the leaves look sick. For fear of more frost, I cut the corn down and put it in, most of it dripping wet, letting it heat to 140°, and some of it more. It being so wet, I could not get men to work, and finally finished it October 26th. I covered with straw and double boarded, no weight except a few fence-posts crosswise of the boards. The greater part of the fodder lay on the ground between two and three weeks. I said to my men: "If this is good for anything, anybody can put up ensilage;" but, to my astonishment, it is coming out and feeding first-class. I cannot tell how the analysis will compare with well-matured fodder properly put in.

One word, to show what ensilage has done for me besides increase of milk and saving of mill-feed. I sold in the springs of 1886, 1887 and 1888, \$1,200 worth of timothy-hay, wintering during the three winters an average of fifty head of cows, horses and young stock, raising the forage on my farm of ninety-five acres, but buying most of the oats and all of the mill-feed used. I am wintering sixty head of horses and cattle this winter, and shall have hay to sell in the spring. Soiling in the summer must not be overlooked. Be ready for a dry summer and fall by having your soiling crops coming in their season. Warm water with a warm stable will increase the flow of milk 10 per cent., and save the same in feed. I have tried it. Who can afford to be without a silo?

DR. GEORGE STUART'S PAPER.

EFFECT OF ENSILAGE UPON THE HEALTH OF ANIMALS.

The use of ensilage undoubtedly frees stock from many of the ills to which they are liable on dry feed. Constipation, impaction of the third stomach of cattle and sheep have not been so prevalent in late years, in our experience. It comes the nearest to summer feed we can get, and the result is favorable in every point of view. Every stockman knows that the young of our farm stock are as frequently affected by constipation as the parents are. The young is the victim of white rush and scouring before it is able to take a mouthful of feed, caused by a feverish condition of the dam, whether mare, cow or ewe. Resort must frequently be made to cow's milk to supply the colt, calf or lamb, and also to medicines, to overcome the evil effects of improper food. These things are not only annoying but expensive, directly or indirectly. Ensilage avoids much of the evils. No stockman who feeds ensilage needs to have his ewe pens marked "milk" or "no milk." Every ewe has enough and to spare. Instead of keeping the cow for the sole purpose of making sure of the lamb supply, you can use her produce to pay her own board.

Ensilage is easily digested. It has undergone a process of partial digestion in the silo. I have yet to learn of a single case of hoove or tympanitis resulting from this food

however freely fed. You do not require a "lamb creep," as when feeding cut turnips, mangels, bran or oats, so that the lamb can go into the next pen and apply itself when beginning to eat, and thus keep the dam from overeating. Take the mare that foaled in October, confined in a box stall with her pet; you do not have to nurse her milk glands by feeding cooked food, so that she can supply her young. Ensilage does the business, with a little bran or oats.

Properly prepared, ensilage contains enough of phosphates to cultivate bone growth in the young. Corn lacks in this, especially for the colt and steer. If starch alone is fed there is no bone material. We know the result when a mare, with colt at foot, gets a run at grass on a winter's day, and we know the result when fed on frosted, indigestible grass. It stops milk secretion. In our climate we cannot grow turnips profitably, as in Scotland or England. We *can* grow mangels; but let my cow have them as freely as she will eat them, she will be as sick a cow in two hours as you will want to see, and will never recover from the effects of the dose; if she has a calf, it will be the death of it. Rich soil will produce thirty tons of mangels per acre; corn may not produce so much, but the latter makes less labor, and a root cellar is more expensive than a silo. We know from practice that mangel-wurzels produce well in milk or beef, but they require care in feeding. No animal has ever been choked or surfeited on ensilage, so far as I know, though I had one case of flatulent colic in a horse, from overfeeding with it.

It is not green fodder alone that makes a perfect food any more than roots. Clean, short oat straw can be used to advantage in the silo, by alternating it with the ensilage, say in layers six or twelve inches thick. The straw absorbs the juices of the ensilage, and is rendered palatable and nutritious; besides, it contains elements that make it useful when fed in this combination. It supplies carbon, so much needed in green fodder. When such ensilage is fed, no hay or other dry fodder is needed.

Ripe sweet corn and millet become quite palatable when mixed in the silo, and there is no danger by clogging the system by feeding the mixture. Butchers are beginning to find out that silo-fed beef is more tender than that fed on dry grain and hay, and it brings a better price. Early lamb is much superior if the dam has had green, succulent food, and ensilage-fed mutton is the best. The tallow is not so chalky, and it brings a better price.

A silo is not expensive, as has been demonstrated here. The layers of straw reduce the fermentation to a minimum. All food put into the silo should be free from smut or ergot, as abortion may result. I have inquired of siloists as to the difference in the health of their stock when fed on ensilage and on dry food. The answer is universal, the ensilage is far ahead.

DISCUSSION.

"Do animals require a full feed of hay once a day when fed on ensilage and oats straw mixed?" "No."

"Does ensilage give better or safer results than mangels?" "Yes; we have no fear of overfeeding, as with mangels."

The following questions, sent out by the *Ohio Farmer*, elicited answers from twenty-one practical dairymen, who have silos:

SILO QUESTIONS AND ANSWERS.

The editor of the *Ohio Farmer* asked the following questions of practical siloists at the Cleveland Silo Institute, and received twenty-one replies, which follow:

Name.....
 Post-office and State.....
 No. of silos.....
 When built—year.....
 Material, stone, wood, etc.....
 Which do you prefer.....
 Capacity of silos—tons.....
 Cost of silo.....
 Crops ensilaged.....
 Cost of ensilage, per ton.....
 How much ensilage do you feed a cow at one feed.....lbs.
 What other food do you add, and how much.....
 Estimate cost of feeding one cow per day.....cents.
 Estimate cost of feeding one cow per day on dry feed; the old way.....cents.
 What is the effect of ensilage on quantity of milk produced, compared with dry feed;
 give per cent. of increase
 How does it affect the quality of milk and butter.....
 Remarks.

B. A. Robinett, Macedonia, Ohio, has two silos, built in 1887, made of wood, plastered with cement, which he prefers. Capacity, 300 tons. Can't estimate cost, as silos were built with the barn. Ensilages B. & W. corn. Cost per ton, about \$2. Feeds 30 pounds to a cow at one feed. Hay at noon, ensilage morning and night. Increases milk production 10 per cent.; quality good.

Lloyd Fisher, Newburg, Ohio, three silos, built in 1886, of wood, lined with cement; capacity, 117 tons each; cost, \$75 each; crops ensilaged, large, southern corn; cost per ton, 75 cents. Feeds 25 pounds to a cow, with 4 quarts bran and 2 quarts corn-meal, or 1 pint old process oil-meal. Cost of feeding one cow per day, 10 cents. Cost per day on dry feed, the old way, 25 cents. Ensilage increases milk product 25 per cent. Covers the ensilage at 125 to 135 degrees. Uses for covering, six inches of straw, two layers of inch boards, and six inches of earth.

Henry Talcott, Jefferson, Ohio, two silos, built in 1885, of wood; capacity, 50 tons each; cost, \$42 for two pits; crops ensilaged, corn, clover, grass, Egyptian corn, sweet corn, and B. & W. Cost of ensilage, 70 cents per ton. Feeds 40 pounds to a cow at one feed, with 2 quarts of chop-feed to milch cows, night and morning. Cost of feeding one cow, per day, 8 cents; the old way, on dry feed, 12 cents or more. Ensilage increases milk product 25 per cent. Quality, excellent.

J. H. Breck, Newburg, Ohio, one silo, built in 1880, of stone and concrete; capacity 240 tons; cost of silo, \$400. Ensilage corn, cost per ton, \$1 to \$1.50. Feed 25 to 40 pounds to a cow, at one time, with corn-meal and oil-meal. Lets ensilage stand two or three days before covering.

G. E. Rice, Warren, Ohio, two silos, built in 1888, of wood, plastered with concrete; capacity, 100 tons; cost, \$100. Ensilages corn and clover. Cost of ensilage per ton, \$2. Feeds 15 pounds at one feed, with wheat bran. Also feeds clover hay. Estimated cost of feeding one cow per day on ensilage, nine cents; the old way, fifteen cents. Increase of product over the old way, 25 per cent. Quality of milk and butter equally as good.

John Barnes, Somerset, Ohio, one silo, built in 1888, of wood; capacity, fourteen tons; cost, \$15; cost of ensilage per ton, \$1. Feed 10 pounds to a cow at one time, bran or crushed corn.

W. A. Wheeler, Perry, Ohio, one silo, built in 1888, of wood; capacity, 45 tons; cost \$40. Cost of ensilage per ton, 35 cents (for filling). Feeds one bushel per feed, with oats and corn, ground, equal parts. Covers ensilage with staw paper, plank and stone.

E. J. Norton, Perry, Ohio, three silos, built in 1888, of wood; capacity, 135 tons; cost of three, \$77. Can't estimate cost of ensilage. Feeds roots and chop. Ensilage increases the milk product 25 per cent., with a better flavor.

S. A. Reed, Oberlin, Ohio, one silo, built in 1888, of wood; capacity, 52 tons; cost, \$35; cost of ensilage per ton, 60 cents; feeds 50 pounds to a cow, per feed, with four pounds bran, and all the wheat-straw she will eat. Ensilage makes the quality of milk better.

E. W. Strong, Delta, Ohio, two silos, built in 1887, of wood, plastered; capacity, 160 tons; cost, \$100; cost of ensilage, \$1 per ton, all told. Feeds 25 pounds at a feed, with corn and cob-meal, or oats and corn, or bran, two pounds. Cost of feeding one cow per day, 5½ cents; cost the old way, 12½ cents. Increases the milk flow 10 per cent., and improves the quality, if any difference. Estimates hay at \$10 per ton, 20 pounds per day, with 2½ cents' worth of mill feed.

John Forbes, Bedford, Ohio, one silo, built in 1888, of stone, 9 feet, and wood and plaster, 16 feet; prefers wood and plaster. Capacity of silo, 81 tons; cost, \$200. Crops ensilaged, field corn; cost per ton, \$2. Feeds 15 pounds to a cow at one feed, with 7 pounds clover hay and 8 pounds of fine middlings per day. Estimated cost of feeding one cow per day, 12 cents; the old way, on dry feed, 16 cents. My ensilage is dry field corn, and I think there is no increase in milk product; quality of milk, excellent.

George Laing, Bedford, Ohio, one silo, three pits, built in 1887, of stone, 10 feet, wood and plaster, 12 feet; prefer wood and plaster; capacity, 300 tons; cost, \$600. I ensilage corn and clover; don't know cost; feed 20 pounds at one feed, with hay, corn, oats and bran.

D. O. Sweet, Rockport, Ohio, one silo, built in 1888, of stone, 4 feet, and wood, 16 feet; capacity, 70 tons; cost of silo, \$125; cost of corn ensilage per ton, \$1.50. Feed 25 pounds twice a day, with 4 pounds bran and 4 pounds corn and oats; cost of feeding one cow per day, 13 cents, against 20 cents the old way. Ensilage increases the milk flow, and quality is equally as good. It is the best food for calves and all young stock, and for beef, that I ever tried.

A. S. Emery, Cleveland, Ohio, one silo, built in 1888, of wood, lathed and plastered with cement; capacity, 250 tons; cost, \$350; plants B. & W. corn; cost of filling, 65 cents per ton; feeds 25 pounds to a cow at one feed, with oats and corn equal weights, 2½ pounds, wheat bran, 1¼ pounds, old process oil-meal, ¾ pounds. Ensilage increased the milk flow 2 gallons a day per cow.

Frank Stein, Niles, Ohio, one silo, three pits, built in 1888, of wood and cement; capacity, 375 tons; cost, \$700; B. & W. corn; cost per ton, 40 cents. Feed 40 pounds at once, with 8 quarts bran and 2 of cornmeal, hay at noon. Cost of feeding one cow per day, 12 cents, against 18 cents the old way. Increase of milk, 25 per cent.

J. E. French, Wickliffe, Ohio, has two silos, built in 1887, of stone, with 16 feet wood on top; (prefers wood) capacity, 54 tons each; cost not known; filled with B. & W. corn, at a cost of 78 cents per ton in 1887, and 93 cents in 1888; feeds 25 pounds per head, with six quarts chop feed to cows giving milk, and 1 quart to young cattle; increased yield of milk in farrow cows nearly half; butter equal to grass butter.

W. Whinery, Winona, Ohio, has one silo, built in 1888, of wood, which is preferred; holds 150 tons; cost, \$150; filled with corn, no record of cost; feeds 25 to 35 pounds per head at a feed, with dry fodder, straw, and about 6 pounds of corn, bran and middlings; increases yield of milk somewhat, without noticeable effect on quality.

N. M. Buck, Mecca, Ohio, has six silos, each 12x16x26 feet, built in 1888, of wood, plastered; capacity, nearly 600 tons, and cost \$550. He filled them with corn, millet and clover, not noting the cost; feeds one bushel at a time, and a small feeding of hay once

a day, with about 5 pounds of bran, oats and corn chop, and middlings; increases yield of milk 25 per cent., without noticeable effect on quality of milk or butter.

W. H. Strong, Java, Ohio, has three silos, of wood, plastered; holding 225 tons, and cost \$200. They are filled with corn at a cost of 85 cents per ton. He feeds 20 to 25 pounds at a time, with 4 pounds equal weights of bran and chops; and a small feeding once a day of dry stalks or hay. It costs 9 cents per day to feed a cow in full milk; if fed on dry fodder, it costs 17 cents per day; increases yield ten per cent., and improves quality very much.

C. L. Johnson, Saybrook, Ohio, two silos, built in 1888, of wood; capacity, 100 tons; cost, \$50; built inside of barn. Ensilaged 4 acres of large ensilage corn. Cost, including use of land, 90 cents per ton. Feeds 40 pounds to one cow, per feed, with dry corn stalks at noon, and straw cut and wet, with grain on it, or hay. Estimates cost of feeding one cow per day, 7 cents. The quality of ensilage milk and butter is as good as that on dry feed, if not better. There are six silos in his (Saybrook) township, Ashtabula county.

R. E. Bullard, manager of the Andalusia stock farm, Salem, Columbiana county, Ohio, three silos, built in 1885, 1887, and 1888, of concrete, and concrete and wood; prefers wood with concrete bottom. Capacity of silos, 125 tons each pit, and ten pits, making a total capacity of 1,250 tons. Ensilage B. & W. corn. Cost per ton, 75 cents—35 cents for raising, 40 cents for filling. Feeds 20 to 30 pounds ensilage at one feed to a cow, with 4 pounds hay at noon. Adds ground feed, bran 3 pounds, chop 2 pounds, old process oil-meal, 1 pound, fine middlings, 1 pound. Cost of feeding one cow per day, on ensilage, 10 cents—ensilage, 2 cents, hay, 2 cents, grain, 6 cents. Cost old way, 16 cents. Increase of milk by ensilage, 20 per cent., and a marked increase of quality. Imparts a fine flavor to butter, with good color and excellent keeping quality. I leave silo uncovered, after filling, until a slight appearance of mould on top; then cover with one foot of cut straw, weighting with a few boards. When opened, keep top level.

Averaging these results, we find the following:

Average cost per ton of ensilage.....	\$1.11
Average cost per day for one cow.....	.09½
Average cost per day for one cow on dry feed.....	.17
Average amount given at one feed.....	29 lbs.

COMPARISON OF FEEDS,

BY MASSACHUSETTS STATE AGRICULTURAL EXPERIMENT STATION.

Bulletin No. 22, October, 1886, furnishes us the data, condensed by the Secretary.

FEEDING EXPERIMENT WITH MILCH COWS.

The feeding experiments were chiefly instituted for the purpose of studying the feeding value of dry corn fodder (stover) as a substitute for English hay, and of beet roots as compared with corn ensilage. The observations made in this connection extended over a period of nearly eight months—November, 1885, to July, 1886.

Two cows, crosses of native stock and Ayrshires, and both from six to seven years old, served for the trial. They were in the same milking period, four weeks after calving, at the beginning of the experiments. The changes in the daily diet, whenever decided upon, were made gradual, to prevent any serious disturbance in the general condition of

the animal on trial. As a rule, from four to five and more days were allowed to pass by, in case of a change of feed, before a record of the daily yield of milk was made for the purpose of comparing the effect of different fodder rations.

The valuation of the various fodder articles consumed is based on our local market prices, per ton, at the time of their use: Good English hay, \$15; corn meal, \$23; wheat bran, \$20; dry corn fodder (stover), \$5; corn ensilage, \$2.75; Lane's Improved Sugar beet, \$5.

The daily diet of both cows consisted, *at the beginning* of the experiments, of three and one-quarter pounds of corn meal, an equal weight of wheat bran, and all the hay they would eat. The actual amount of hay consumed, in each case, was ascertained by weighing out, daily, a liberal supply of it and deducting subsequently the hay left over. The same fodder mixture, as far as quality and quantity are concerned, was also used for some time as daily feed *at the close* of the experiment. This course was adopted for the purpose of ascertaining the natural shrinkage in daily yield of milk during the time engaged by the experiments (from seven to eight months). It amounted, as may be noticed by the subsequent detailed record, to nearly fifty per cent. of the original yield of milk.

The above stated combination of fodder articles was adopted, not as best possible combination of fodder rations for milch cows, but because the Station had used it before, satisfactorily.

RECORD OF DAISY.

Feeding periods.	Feed consumed (lbs.) per day.						Amount of Dry Vegetable Matter contained in the daily Fodder consumed, in pounds.	Quarts of Milk produced per day.	Pounds of Dry Matter per quart of milk.	Nutritive Ratio.	Weight of Animal.	Cost in cents per quart of milk.
	Wheat Shorts.	Corn Meal.	Corn Fodder (stover).	Hay.	Corn Ensilage.	Roots.						
1885.	3.25	3.25	.....	20.00	.....	.....	24.06	16.3	1.48	1:8.2	910	1.35
	3.25	3.25	8.00	10.00	.....	.....	21.64	15.4	1.45	1:7.9	895	1.07

1886.	3.25	3.25	12.00	5.00	.....	.....	20.44	14.2	1.44	1:7.72	850	.97
	3.25	3.25	.....	15.00	.....	.....	23.91	14.2	1.68	1:7.1	845	1.76
	3.25	3.25	.....	15.00	.....	27.00	21.06	13.2	1.60	1:6.9	850	1.60
	3.25	.....	.....	15.00	.....	40.00	23.18	13.3	1.74	1:6.7	873	1.84
	3.25	3.25	.....	15.00	.....	27.00	23.89	14.2	1.68	1:7.1	860	1.76
	3.25	3.25	.....	14.60	20.63	.....	23.73	12.8	1.85	1:8.14	870	1.61
	3.25	3.25	.....	10.00	29.71	.....	21.51	11.0	1.91	1:8.15	865	1.67
	.....	3.25	.....	5.00	41.75	.....	16.83	9.2	1.83	1:10.17	830	1.37
	3.25	.....	.....	5.00	41.36	.....	16.76	8.9	1.88	1:8.29	855	1.39
	3.25	3.25	.....	20.00	.....	.....	24.04	8.4	2.86	1:8.2	840	2.64

RECORD OF MOLLIE.

Feeding periods.	Feed consumed (lbs.) per day.						Amount of Dry Vegetable Matter contained in the daily Fodder consumed, in pounds.	Quarts of Milk produced per day.	Pounds of Dry Matter per quart of milk.	Nutritive Ratio.	Weight of Animal.	Cost in cents per quart of milk.
	Wheat Shorts.	Corn Meal.	Corn Fodder (stover).	Hay.	Corn Ensilage.	Roots.						
1885. Nov. 20—Dec. 7..... Dec. 19—29.....	3.25	3.25	.....	20.00	.....	.....	24.06	12.62	1.93	1:8.2	882	1.74
	3.25	3.25	8.00	10.00	.....	.....	21.64	11.86	1.82	1:7.9	885	1.39
	3.25	3.25	13.55	5.00	.....	.....	21.75	13.87	1.56	1:7.87	845	1.02
1886. Jan. 3—22..... Feb. 1—17..... " 17—28..... March 1—8..... " 12—22..... " 25—April 13..... April 18—May 6..... May 20—31..... June 4—14..... " 26—July 4.....	3.25	3.25	.....	15.00	.....	27.00	23.91	11.16	2.14	1:7.1	868	2.24
	3.25	3.25	.....	15.00	.....	27.00	21.06	13.2	1.60	1:6.9	910	1.99
	3.25	3.25	.....	15.00	.....	40.00	23.18	10.6	2.19	1:6.7	895	2.32
	3.25	3.25	.....	15.00	.....	27.00	23.89	11.1	2.15	1:7.1	905	2.25
	3.25	3.25	.....	14.20	22.27	.....	23.74	11.2	2.12	1:8.17	921	1.84
	3.25	3.25	.....	10.00	29.82	.....	21.58	10.6	2.04	1:8.15	899	1.83
	3.25	3.25	.....	5.00	36.83	.....	16.64	8.9	1.87	1:10.9	850	1.37
	3.25	3.25	.....	5.00	40.63	.....	16.59	9.1	1.82	1:8.25	852	1.33
	3.25	3.25	.....	20.00	.....	.....	24.04	8.6	2.80	1:8.2	890	2.51
	3.25	3.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

CORN FODDER (STOVER).

From the Experiment Station, 1885.

	Percentage composition.	Constituents (in lbs.) in a ton of 2000 lbs.	Pounds digestible in a ton of 2000 lbs.	Per cent. of digestibility of constituents.	Nutritive ratio.
Moisture at 100° C	15.40	308.0			1 : 9.3
Dry matter.....	84.60	1692.0			
	100.00	2000.00			
ANALYSIS OF DRY MATTER.					
Crude Ash	4.22	84.4			
“ Cellulose.....	20.93	418.6	301.39	72	
“ Fat.....	2.63	52.6	39.45	75	
“ Protein, (nitrogenous matter).....	9.17	183.4	133.88	73	
Non-nitrogenous extract matter.....	63.05	1261.0	844.87	67	
	100.00	2000.00	1319.59		

The corn fodder was raised under the same conditions, as far as the soil and the fertilizers used were concerned, as the corn for the silos. The same variety of corn, Clark, was planted in both instances.

CORN ENSILAGE.

From the Silos of the Experiment Station (1885—1886).

	Percentage composition.	Constituents (in lbs.) in a ton of 2000 lbs.	Pounds digestible in a ton of 2000 lbs.	Per cent. of digestibility of constituents.	Nutritive ratio.
Moisture at 100° C	77.48	1549.60	1 : 11.3
Dry matter.....	22.52	450.40	.....	.....
	100.00	2000.00	.....	.....
ANALYSIS OF DRY MATTER.					
Crude Ash	4.19	83.80	.....	.....
“ Cellulose	19.08	381.60	274.68	72	
“ Fat	3.49	69.80	52.42	75	
“ Protein, (nitrogenous matter)	7.82	156.40	114.17	73	
Non-nitrogenous extract matter.....	65.42	1308.40	876.63	67	
	100.00	2000.00	1317.90

The above analysis represents the mean composition of the ensilage obtained from the silos described in previous BULLETINS. The contents of the different silos were fed in direct succession, beginning with the one which had been filled slowly. The corn was about six months in the silos when the feeding of the ensilage commenced.

WHEAT BRAN.

Amherst mill, 1885.

81.93 per cent. passed through mesh 144 to square inch.

	Percentage Composition.	Constituents (in lbs.) in a ton of 2000 lbs.,	Pounds digestible in a ton of 2000 lbs.	Per cent. of digestibility of constituents.	Nutritive Ratio.
Moisture at 100° C.....	12.05	241.00	1 : 3.77
Dry Matter	87.95	1759.00	.....	.....
	100.00	2000.00	.....	.....
ANALYSIS OF DRY MATTER.					
Crude Ash.....	6.64	132.80	.....	.....
“ Cellulose....	11.49	229.80	45.96	20	
“ Fat.....	4.75	95.00	76.00	80	
“ Protein (nitrogenous matter).....	17.86	357.20	314.34	88	
Non-nitrogenous extract matter.....	59.26	1185.20	948.16	80	
	100.00	2000.00	1384.46	.....

The above analysis represents the average quality of the wheat bran fed during the time of the experiment.

CORN MEAL.

Amherst mill, 1885.

	Percentage composition.	Constituents (in lbs.) in a ton of 2000 lbs.	Pounds digestible in a ton of 2000 lbs.	Per cent. of digestibility of constituents.	Nutritive ratio.
Moisture at 100° C.....	12.62	252.40	1 : 8.76
Dry matter.....	87.38	1747.60	.....	.....
	100.00	2000.00	.....	.....
ANALYSIS OF DRY MATTER.					
Crude Ash.....	1.56	31.20	.....	.....
“ Cellulose.....	2.66	53.20	18.09	34	
“ Fat.....	4.27	85.40	64.90	76	
“ Protein (nitrogenous matter).....	11.43	228.60	194.31	85	
Non-nitrogenous extract matter.....	80.08	1601.60	1505.50	94	
	100.00	2000.00	1782.80	.....

COMPARISON ENSILAGE AND TURNIP FEEDING,

BY ONTARIO AGRICULTURAL COLLEGE AND EXPERIMENTAL FARM.

Made four years of experiments with ensilage and turnips, and closed up the work, with the following report:

DAIRY PRODUCTS FROM ENSILAGE AND TURNIP-FED COWS.—PER HEAD PER DAY.

	Ensilage.			Turnips.		
	Milk.	Cream.	Butter.	Milk.	Cream.	Butter.
	Lbs.	Per cent.	Lbs. per 100 lbs. Cream.	Lbs.	Per cent.	Lbs. per 100 lbs Cream.
November	25	11	.....	23½	7½	.....
December.....	24½	8	38½	39	7½	39
January	33	8	44	26	8½	40
February	29	12½	.....	27	12½	.....
Means.....	28	9½	41	29	9	39½

DAIRY PRODUCTS FROM ENSILAGE AND TURNIP-FED COWS.

For the third time we have placed ensilaged corn against turnips in the production of milk in quantity and quality. The plan from 1884-85 was similar to others by setting aside four cows as equally matched as possible, in regard to kind, size, time after calving, and apparent milking properties—two on ensilage and two on turnips—alternating each pair every month, so that any condition, for or against, was met by alternating. At time of exchange, seven days were allowed for the new food to over-influence the old before testing re-opened. The experiment began on the 19th of November, and was closed on the 2nd of March, last.

The average daily consumption of food per head in each case was:

Ensilage—30 lbs.; hay, 9 lbs.; and bran, 13 lbs.

Turnips—30 lbs.; hay, 9 lbs.; and bran, 13 lbs.

The case was therefore equal weights of ensilage and turnips, and equal weights of hay and bran. It is then only necessary now to submit the results:

WEIGHT OF COWS UNDER THIS EXPERIMENT.

	Average weight on entry.	Average weight at finish.	Difference.
Ensilage	1187	1207	20
Turnips	1185	1192	7

This statement has one very prominent feature—uniformity of averages in all the three products, and there was not even any large difference any month.

Then also, the weight of the cows on entry and closing of each of the terms shows no practical difference, so that all over we are to gather up some points of real value.

That this preserved, short cut, green corn-fodder has, weight for weight, been equal to turnips in the production of dairy products, demands some thought, for prejudice is still strong against this new form of winter green fodder. A fleshy bulb like turnips is, of course, a very different fodder to the stalk and leaves of one of the cereals, as corn, and hence it can be said of such an ensilaged plant that it is more likely to meet the wants of animal sustenance and produce, than a bulb having about 90 per cent. of water in its composition. Much, however, of the object of a green fodder in winter is to keep animals in a natural condition, not necessarily for much feeding value, but if feeding value can be combined with the green condition, the two objects are attained. Now, while I am an unflinching advocate of a root division in the rotation of every farm, for objects absolutely indispensable to first-class agriculture, I am prepared to accept ensilage if, as a crop, it can do the same thing. We require a change of crop, a cultivated crop, a deep-rooting crop, a crop that lives upon the sub-soil and atmosphere, and a crop at all times sweet and good for food. Corn, and I speak of it now only because it is the standard of this country, cannot possibly take the place of roots in a division of cropping, for its whole character and requirements differ so essentially that neither fallowing nor soil relief could be brought about by its substitution for roots. I am not prepared at present to allow for both crops on a farm, as may be advanced by those who argue for variety, as a safer investment, until it is shown that both—place as a crop and crop value—are as good with corn-fodder as with roots. With reference to food value, it cannot be shown that ensilaged corn-fodder is either so natural, so palatable, or really of more value for any class of animals, as turnips and mangolds; animals will not eat so much of the one as of the other, nor can corn-stalks and leaves be possibly kept sweet; *there is no such thing as sweet ensilage*; as the writer has examined, within the last three years, silos in the States, in Canada and in England.

Then also, ensilage cannot be fed alone, as roots can, nor even as hay—it must be treated with some foreign grain, or mixed with dry fodder, such as hay.

ENSILAGE vs. DRY FODDER CORN.

In the Fifth Annual Report of the Agricultural Experiment Station, at Madison, Wisconsin, Prof. W. A. Henry has a valuable paper on "*Ensilage versus Dry Fodder Corn for Producing Milk and Butter.*"

Omitting details, we find that he desired to test the yield and value of Yellow Dent, Sweet Corn and B. & W. Ensilage Corn, for silo purposes. The following is the result:

YIELD PER ACRE OF ENSILAGE FODDER CORN.

Yellow Dent.....	24,890 lbs.
Sweet Corn.....	36,960 "
B. & W. Ensilage..	47,040 "

A storm blew down the larger corn before it was fully matured, and is believed to have detracted somewhat from its showing.

YIELD OF FOOD ELEMENTS PER ACRE.—YELLOW DENT, 24,890 LBS. PER ACRE.

	Per cent.	Total in one acre.
Ash	2.22	597.4 lbs.
Protein.....	2.49	619.7 "
Fat.....	0.49	122.0 "
Crude fiber.....	7.82	1,946.0 "
Nitrogen free—extract.....	15.98	3,977.4 "
Total dry matter.....	29.00	7,262.5 lbs.

LARGE SWEET.—YIELD PER ACRE, 36,960 LBS.

	Per cent.	Total in one acre.
Ash.....	2.04	753.7 lbs.
Protein	2.12	783.4 "
Fat.....	0.45	166.3 "
Crude fiber.....	7.67	2,834.0 "
Nitrogen—free extract.....	10.37	3,832.0 "
Total dry matter	22.65	8,369.4 lbs.

BURRILL & WHITMAN CORN.—YIELD PER ACRE, 47,040 LBS.

	Per cent.	Total in one acre.
Ash.....	1.59	748.0 lbs.
Protein	1.81	851.5 "
Fat.....	0.28	134.2 "
Crude fiber.....	6.80	3,199.0 "
Nitrogen—free extract	7.22	3,396.0 "
Total dry matter.....	17.70	8,328.7 lbs.

These tables show the sweet corn to have about 40 pounds more dry matter than the B. & W. corn. But it is believed that if the latter had not been blown down before mature, it would have shown a somewhat greater yield of dry matter; still it would not have been at all commensurate with its greater weight.

LONG FODDER AND ENSILAGE.

The next step in the experiment was to feed long fodder and ensilage and note results. (For details see table in Fifth Annual Report Ag. Ex. Station, pp. 13, 14, 16.) We must be satisfied to state that in each case 672 lbs. bran and corn-meal were fed to supplement both the ensilage and long fodder. We find in first trial:

	Milk.	Butter.
4,960 lbs. ensilage produced.....	1,088 lbs.	62 lbs. 3 oz.
1,227 lbs. fodder produced.....	1,487 "	58 lbs. 11 oz.
Excess in favor of ensilage.....	201 lbs.	3 lbs. 8 oz.

In second trial, when feeding 448 lbs. of bran and corn-meal, the result was:

	Milk.	Butter.
3,600 lbs. ensilage produced.....	1,100 lbs.	44 lbs. 10 oz.
829 lbs. fodder produced.....	1,113 "	44 " 9 "

In third trial, when long ensilage was fed against long fodder, with 288 lbs. of grain, the results was:

	Milk.	Butter.
2,298 lbs. ensilage produced.....	694 lbs.	30 lbs. 4 oz.
887 lbs. fodder produced.....	715 "	27 " 15 oz.
Excess in favor of fodder.....	21 lbs	
Excess in favor of ensilage.....		2 lbs. 5 oz.

So far as they go, these results may be considered as showing that ensilage is favorable to a continuance of the milk flow.

AMOUNT OF DRY MATTER CONSUMED.

First Trial.

Ensilage fed, 4,960 lbs. =.....	1,094.17 lbs. dry matter.
Dry fodder fed, 1,227 lbs. =.....	957.67 lbs. " "
Excess of dry matter fed in ensilage.....	136.50 lbs.

Second Trial.

Ensilage fed, 3,600 lbs. =.....	612.72 lbs. dry matter.
Dry fodder fed, 829 lbs. =.....	603.97 lbs. " "
Excess dry matter fed in ensilage.....	8.75 lbs.

Third Trial.

Long ensilage fed, 2,298 lbs. =	387.90 lbs. dry matter.
Long dry fodder fed, 887 lbs. =	654.16 lbs. " "
Excess of dry matter in fodder.....	266.26 lbs.

DRY MATTER REQUIRED TO PRODUCE A POUND OF BUTTER.

First Trial.

17.5 lbs. dry matter in <i>ensilage</i> produced	1 lb. butter.
16.3 " " " " <i>dry fodder</i> "	1 lb. "

Second Trial.

13.5 lbs. dry matter in <i>ensilage</i> produced.....	1 lb. butter.
13.3 " " " " <i>dry fodder</i> "	1 lb. "

Third Trial.

12.8 lbs. dry matter in <i>long ensilage</i> produced.....	1 lb. butter.
23.4 lbs. " " " <i>long, dry fodder</i> "	1 lb. "

In this trial it will be remembered the cows failed to eat the coarse stalks.

Last year it was found in a similar trial. (See Fourth Wis. Report, 1887, p. 72).

15.69 lbs. of dry matter in <i>ensilage</i> produced.....	1 lb. butter.
16.11 lbs. " " <i>corn fodder</i> produced.....	1 lb. butter.

With carefully housed fodder corn, it appears "that a pound of dry matter in *ensilage* is worth no more, if indeed it is quite so valuable, as a pound of dry matter in fodder of such quality as this was."

LOSSES IN MAKING ENSILAGE AND IN CURING FODDER.

The loss in several instances was as follows:

Loss in Dry Matter.

Sweet corn <i>ensilage</i> in silo No. 2.....	22.04 per cent.
Dried sweet corn fodder carefully housed.....	36.61 per cent.
Yellow dent corn <i>ensilage</i> in silo No. 1.....	31.81 per cent.
Dried yellow dent fodder corn carefully housed.....	18.55 per cent.
B. & W. and flint mixed in silo No. 5.....	24.31 per cent.

The loss in the dried sweet corn fodder was excessive, and a small portion of the loss is probably due to the fact that the corn began to heat soon after being shocked. As soon as discovered, the corn was reshocked. Great care was exercised to preserve the fodder in the best possible condition. Farmers cannot afford to take the pains bestowed on this as it was shocked in the loft of a barn to cure.

The loss of 31.81 per cent. in silo No. 1, was partly due to springing of a board in the bottom of the silo, which let in air.

The yellow dent fodder, corresponding to that put in silo No. 1, shows a loss of 18.55.

It seems fair to say that the farmer who leaves fodder one month after it is cut and shocked, loses about 20 per cent. of the total dry matter. The loss is greater in proportion as it is longer exposed. The losses in these silos are believed to be larger than would have occurred if the silos had been larger. The loss of fodder seems to be from 20 to 25 per cent., and this loss cannot be reduced by any present methods of storing it. It is believed the loss in the silos can be very materially reduced in larger and better silos.

STORAGE ROOM COMPARED.

In a hay mow every cubic foot contains about 5 pounds of hay. Deducting 15 per cent. for moisture, we have 4.25 pounds dry matter in a cubic foot of hay. In a cubic foot of ensilage there was, according to the depth, 7.26 to 7.95 pounds of dry matter. Corn fodder is seldom stored as closely as hay, hence it is clear more feed can be stored in a silo than in a mow, as usually done.

The cost of handling ensilage is believed to be no greater than of handling fodder.

INCIDENTAL POINTS.

Cows fed ensilage drank considerable less water than those fed on dry stalks. When fed on ensilage, four cows in 21 days drank 2,376 pounds of water. The same cows in 21 days drank 5,235 pounds of water when fed on fodder; or 26 pounds in one case, and over 62 pounds in the other (see p. —, Vollcher's Expt. Steer Feeding.)

It was found in trial No. 3, where long ensilage was fed against long fodder, the cows ate stalks as well as leaves, husks, etc., to the amount of 387.9 pounds, and it required 654.16 pounds of the long dry fodder to maintain them the same length of time.

This shows that the stalks have considerable feeding value, if they can only be masticated. In two trials it was found that the corn fodder was eaten readily, if reduced into fine pieces by the cutting box.

In the third trial it was found that it took nearly twice as much long fodder as ensilage, because so much was not eaten.

Farmers having made ensilage go twice as far as long fodder, must grant that the saving arose largely from the fact that the ensilage was cut fine and could be eaten more readily.

Farmers who carefully house their corn fodder and cut it fine, have

found it to go much farther than when fed long out of doors on the snow, or grass, or in the mud. The economy of the silo will be found in the convenient form of the feed for storing and for consumption, and the fact that it was put into the silo at a time when the labor could be done more cheaply.

Ensilage, like ruta-bagas, beets and turnips, should not be the only feed ; it needs to be supplemented with bran and dry fodder or hay.

NEW JERSEY EXPERIMENT STATION BULLETIN XIX

Is specially valuable in this connection :

GREEN FODDER CORN ; DRIED FODDER CORN ; ENSILAGE.

Two very important questions are considered in the following bulletin: First, is the loss of food, by fermentation, when green fodder corn is dried in stacks, greater or less than when it is preserved in a silo? Second, is ensilage more valuable for milk production than dried fodder corn ?

To study these questions, an experiment was begun on the College Farm on the first of September, 1881. At that time the corn was in the milk, the stalks were very rich in cane sugar, and all conditions apparently were favorable for the trial.

The amount of available green fodder corn, by actual weight, was ten tons. Of this one-half was arranged in the field in fifty small stacks; while the other half, after it had been cut by horse-power into lengths of three-sixteenths of an inch, was closely packed in a silo of about twelve tons capacity. The analysis of a sample taken with the utmost care to represent the entire quantity used in this experiment, gives the chemical composition of the corn before it was affected either by loss of moisture or by fermentation.

About the last of November, after an exposure to the weather of nearly three months, twelve hundred pounds of the dried stalks were passed through a *Lion Cutter and Crusher*, then thoroughly mixed and sampled. The analysis of this sample compared with that of the original green corn, shows the changes which occurred during the process of field curing.

On the twenty-third of December, the contents of the silo were found to be in an excellent state of preservation. A sample taken eighteen inches from the surface was entirely free from disagreeable smell, insipid to the taste, and, as shown by the analysis, equal in all respects to the best ensilage which has yet been received at this Station. The chemical composition of these three samples can be seen in the following table. It should be remembered that sample No. I represents the green corn, while

samples Nos. II and III represent fodders obtained from this corn by two different methods of preservation.

TABLE No. I.

	No. I. Green Stalks.	No. II. Dried Stalks.	No. III. Ensilage.
Water	75.00	39.37	74.70
Ash	1.58	4.63	1.95
Protein	1.25	3.84	1.75
Fat .....	.22	.66	.27
Fiber	6.35	18.65	7.86
Carbohydrates	15.60	32.85	13.47
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00

On account of the different amounts of water in these samples, their relative compositions are not plainly seen. Comparisons between them can be easier made by arranging the results in another table, in which the composition of 100 pounds of the dry matter of each sample is given. Table No II is computed for this purpose.

TABLE No. II.

	No. I. Green Stalks.	No. II. Dried Stalks.	No. III. Ensilage.
Ash	6.32	7.64	7.71
Protein	5.00	6.33	6.92
Fat .....	.88	1.09	1.06
Fiber	25.40	30.76	31.07
Carbohydrates	62.40	54.18	53.24
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00

The ash of corn stalks is that portion which cannot be destroyed by fire. It is not in the least affected by fermentation, nor is it probable that its total amount was in any way changed, either after the corn was packed away in the silo, or after it was stacked. It is therefore adopted as a standard in comparing the above analyses.

It has been shown that one hundred pounds of the green corn contained seventy-five pounds of water; four hundred pounds, therefore, of this corn would have yielded one hundred pounds of dry matter containing 6.32 pounds of ash. The question now is, *what is the weight of dry matter in the ensilage and in the field-cured stalks which contains 6.32 pounds of ash?* A simple calculation from the figures in table No. II gives the following results:

TABLE No. III.

	No. I. Green Stalks.	No. II. Dried Stalks.	No. III. Ensilage.
Ash.....	6.32	6.32	6.32
Protein.....	5.00	5.24	5.67
Fat.....	.88	.90	.86
Fiber.....	25.40	25.44	25.49
Carbohydrates.....	62.40	44.82	43.64
Total weight dry matter.....	100.00 lbs.	82.72 lbs.	81.98 lbs.

Eighty-two pounds of the dry matter of the ensilage, and eighty-two and three-quarter pounds of the dry matter of the field-cured stalks now contain the same weight of ash which one hundred pounds of the dry matter of the green corn contained. *During the process of field-curing, therefore, four hundred pounds of green corn lost seventeen and one-quarter pounds of dry matter; while four hundred pounds of green corn packed in a silo lost eighteen pounds of dry matter.* Table No. III shows further, that neither the field-cured corn nor the ensilage suffered a loss of protein, fat or fiber, but that the total loss fell upon the class, carbohydrates, which includes sugar, starch, etc., the least costly ingredients of fodders.

Admitting now, that quite as much of the dry matter of green corn was preserved, *in this experiment*, by field-curing as by packing in a silo, there remains still several important questions to be considered. First, will cows eat the dry corn fodder as readily and with as little waste as they will eat ensilage? Second, how does the milk of cows which are fed dried fodder corn compare in quantity and quality with the milk of the same cows when ensilage is used.

A feeding trial was begun on the 6th day of December, for the purpose of studying these questions. Four cows were selected from the herd, placed side by side, fed, watered and exercised at the same time, and for sixty consecutive days treated in all respects as nearly alike as was possible.

During the first period of twenty days, all four cows were fed the same daily ration made up for each 1,000 pounds of live weight of—

	Fat.	Protein.	Carbohydrates.
20 lbs. of Dried Fodder Corn, containing.....	.10 lbs.	.57 lbs.	7.08 lbs.
3 lbs. Winter Wheat Bran, containing.....	.10 lbs.	.40 lbs.	1.88 lbs.
20 lbs. Brewers' Grains, containing.....	.40 lbs.	1.58 lbs.	3.00 lbs.
Total Digestible Food.....	.60 lbs.	2.55 lbs.	11.46 lbs.

The digestibility of the dried corn is here assumed to be the same as green corn.

During the second period of twenty days, the daily ration for two of the cows was the same as during the first period; the other two were fed ensilage instead of dried fodder corn. For each 1,000 pounds of live weight this second ration was

	Fat.	Protein.	Carbohydrates.
50 lbs. of Ensilage, containing.....	.10 lbs.	.64 lbs.	7.34 lbs.
3 lbs. Winter Wheat Bran, containing.....	.10 lbs.	.40 lbs.	1.38 lbs.
30 lbs. Brewers' Grains, containing.....	.40 lbs.	1.58 lbs.	3.00 lbs.
Total Digestible Food.....	.60 lbs.	2.62 lbs.	11.72 lbs.

The digestibility of the ensilage is here assumed to be the same as green corn.

This ensilage ration was fed to all four cows during the third period of twenty days.

The dried fodder corn, as stated above, was cut and crushed in a machine which leaves it in such a condition that cows can eat it easily. After the first day or two, in the first period, the dried corn ration was eaten without waste. During the second period one of the cows seemed unable to eat all of the harder pieces of ensilage; the amount wasted, however, was regarded as too small to be taken into account. *The facts, therefore, seem to show that dried fodder corn, when cut and crushed, is eaten quite as readily, and with as little waste, as ensilage.*

During the entire experiment the cows were milked twice daily, at 4 A. M. and at 4 P. M. The milk of each cow was weighed separately, and its weight at once recorded.

Analyses of the milk were made on five consecutive days in each period. For this purpose sample No. I represented the total daily yield of cows I and II, while sample No. II represented that of cows III and IV. Results obtained when the cows were fed ensilage are, for sake of comparison, printed in figures with asterisk (*) attached.

Number of each cow.	I.	II.	III.	IV.
Calved.....	Nov. 14, 1881.	Nov. 23, 1881.	Aug. 1, 1881.	Aug. 1, 1881.
Served.....	Jan. 27, 1882.	Jan. 7, 1882.	Sept. 18, 1881.	Oct. 1, 1881.
Yield of Milk during first period.....	624 lbs.	540 lbs.	339 lbs.	350 lbs.
Yield of Milk during second period.....	624 lbs.	526 lbs.	*340 lbs.	*401 lbs.
Yield of Milk during third period.....	*579 lbs.	*500 lbs.	*300 lbs.	*386 lbs.
Total yield of each cow for 60 days...	1827 lbs.	1566 lbs.	979 lbs.	1137 lbs.

In the following tables cows I and II form herd No. I, cows III and IV herd No. II. The analytical results given below are *averages*, drawn from the daily determinations of the milk of five consecutive days in each period.

	Herd No. I.					Herd No. II.				
	Specific Gravity.	Total Solids.	Butter.	Protein.	Sugar and Ash.	Specific Gravity.	Total Solids.	Butter.	Protein.	Sugar and Ash.
First period.....	10840	13.55	4.27	3.31	5.87	10340	13.87	4.27	3.43	6.17
Second period.....	10827	13.55	4.49	3.11	5.95	*10343	*14.01	*4.42	*3.41	*6.18
Third period.....	*10330	*13.87	*4.58	*3.20	*6.09	*10346	*14.51	*4.53	*3.59	*6.39

As cows advance in their periods of lactation, the per cent. of solid matter in their milk gradually increases; while the yield of milk, as is well known, decreases. A second table is therefore given, in which the absolute amounts of butter, protein, etc., yielded by each herd during each period are compared.

	Total Solids.		Butter.		Protein.		Sugar and Ash.	
	Herd I.	Herd II.	Herd I.	Herd II.	Herd I.	Herd II.	Herd I.	Herd II.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Total Weight Yielded during first period.....	157.7	95.5	49.7	29.4	38.5	23.6	68.3	42.5
Total Weight Yielded during second period	155.8	*103.8	51.6	*32.7	35.8	*25.2	68.4	*45.8
Total Weight Yielded during third period.....	*149.6	*99.5	*49.4	*31.0	*34.2	*24.6	*65.7	*43.8

A summary of the facts shown in the above experiment is as follows :

First. When the green corn was dried in *stacks* the loss of food was *less* than it was when the corn was *packed* in a *silo*.

Second. When dried corn fodder was cut and crushed it was eaten by the cows under experiment quite as readily, and with as little waste, as ensilage.

Third. In three cases, the yield of milk was not increased when ensilage was substituted for dried corn, but in one case, ensilage caused an increase of eighty-seven pounds of milk in forty days.

Fourth. In the mixed milk for twenty days of herd No. I, ensilage caused no increase in the yield of total solid matter; while in the milk of herd No. II for the same period it caused a gain of eight and one-third pounds, or seven per cent.

GEO. H. COOK, *Director*.

DRY FODDER vs. ENSILAGE.

If space would permit, we would like to give entire, in this connection, Bulletin No. 8, Missouri Agricultural Experiment Station, J. W. Sanborn, Director. We can only give the "pivotal facts touching the food used." Omitting the detail of the experiments and the tables, we will follow with the conclusions and reviews of data:

I. Alternate sets of rows of sugar corn were put, one set in a stone silo and the other set in a compact body in a barn.

II. Alternate sets of four rows each of field corn were put, one set in silo, and the other in the barn, over the sugar corn fodder.

III. The ensilage was well preserved, and formed what is known as sweet ensilage, yet containing a moderate amount of acid, but lost 34.3 per cent. of its dry matter.

IV. The field fodder corn kept very nicely in the barn, losing but a little over one per cent. of dry matter.

V. In all respects the dry-stored half was secured and preserved at a decided advantage over that put into the silo.

VI. The sugar corn was grown by the then director, after the old and abandoned method, very thick sowing, in drills 16 inches apart.

CONCLUSIONS AND REVIEW OF DATA.

I. Bulletin No. 7 gives data showing that corn fodder may be successfully dry-stored and at cheaper rates, both for protection and labor, than when stored in the green state.

II. This Bulletin shows that a given amount of food dry-stored lasted markedly longer than the same amount of food put into the silo.

III. The ratio of growth of dry food fed steers was as great or greater than the ensilage fed steers when compared with the growth of each lot when fed alike; yet the growth of ensilage-fed steers was greater.

IV. The ensilage-fed steers seem to have made a more water or less substantial growth than those dry-fed, and probably did not make really as great growth of solid matter.

V. Sugar corn proved a better food for cows and poorer for steers than field corn fodder.

VI. Dry fodder for cows proved more effective, especially dried sugar corn, than ensilage.

VII. Cows fed on dry fodder gave the richest milk, 20.58 lbs. of the former making a pound of butter, while 22.79 lbs. of the latter were required.

VIII. The dry fodder-fed cows was the best churning milk, or raised the largest ratio of its fat in the milk.

IX. The dry fodder-fed cows gave the largest per cent. of solids in the milk.

X. The dry food gave the best butter, which seemed to keep better.

XI. The dry food was cheaper handled.

XII. The cows maintained their live weight best on dry food.

XIII. The trial on the whole favors the view that a pound of organic matter will produce more growth of solid or dry substance when eaten in the air-dried state, than when stored in the silo, but the question in this trial is an evenly balanced one on this point.

XIV. The trial as a whole shows that the air-drying method, with dry storage in a good barn in a compact form, is decidedly the more economical method of the two.

XV. In a very bad year the disadvantages of the air-drying system might be equal to the disadvantages of the silo, but they would have to be severe to warrant stock-raisers in Missouri in investing in the silo extensively. The facts secured will not warrant me in advising our farmers to build silos, until a radical change in the effectiveness and economy of the silo is made, or a radical change occurs in surrounding conditions.

Respectfully submitted.

J. W. SANBORN, *Director*.

COMPARATIVE VALUE OF ENSILAGE AND DRY FEED FOR STEERS.

Dr. J. A. Voelcker, at the suggestion of the Royal Agricultural Society of England, has reported in its Journal the result of his experiments in feeding hay and ensilage to steers.

He made the grass of same fields into ensilage hay and cut at the same time.

He fed twelve Hereford bullocks about thirty months old and of great uniformity, so that there was only fifty-two pounds difference in the set of six fed ensilage and the set of six fed hay.

Feed was given ad libitum, and the amount consumed was carefully weighed; also the water consumed was weighed.

The average of hay consumed in eighty-four days was 20.3 lbs. to each steer, with 70.7 lbs. of water, a total of 91 lbs.

The other lot consumed an average of fifty-one lbs. per day of ensilage and drank 40.1 lbs. of water, a total of 91.1 lbs.

The *hay-fed steers* gained 989 lbs. in 84 days, or 1.96 lbs. a day.

The *ensilage-fed steers* gained 999 lbs., or 1.98 lbs. per day.

A very remarkable condition in an experiment of eighty-four days' feeding.

STATISTICS
OF THE DIFFERENT
CROPS AND PRODUCTIONS
FOR THE YEAR 1888,

ALSO OF
MAPLE SUGAR FOR 1889, SHEEP KILLED AND INJURED BY
DOGS FOR THE YEAR PRECEDING THE SECOND MONDAY
OF APRIL, 1889, AND THE NUMBER OF DOGS ; ALSO
THE NUMBER OF HORSES, CATTLE, SHEEP,
HOGS AND MULES FOR THE YEARS 1888
AND 1889.

LANDS OWNED IN 1888.

Counties.	Acres cultivated.	Number acres pasture.	Number acres woodland.	Number acres lying waste.	Total number acres owned in 1888.
Adams	77,592	92,880	81,233	11,725	263,450
Allen	124,533	22,499	45,829	204	192,367
Ashland	144,805	45,226	42,675	5,183	221,285
Ashtabula	125,027	136,875	53,231	2,876	318,009
Athens	44,892	118,488	49,944	14,096	226,166
Auglaize	127,115	24,921	54,499	1,043	207,578
Belmont	92,492	137,579	46,304	7,442	283,797
Brown	94,720	88,102	36,887	6,993	244,060
Butler	145,237	26,300	28,415	10,429	210,381
Carroll	59,610	113,467	38,399	483	211,958
Champaign	164,557	34,213	62,667	.....	261,437
Clarke	101,561	37,559	20,802	2,096	163,277
Clermont	110,252	69,946	28,803	9,910	218,911
Clinton	117,379	58,114	33,237	3,319	212,049
Columbiana	141,141	77,137	44,596	4,214	266,650
Coshocton	91,683	146,673	56,497	2,065	296,918
Crawford	132,800	38,891	39,433	724	211,848
Cuyahoga	106,257	67,386	22,444	5,042	201,129
Darke	227,232	25,579	68,096	6,881	327,788
Defiance	116,483	13,387	67,545	1,239	198,654
Delaware	127,303	80,702	42,064	1,537	251,606
Erie	74,355	16,602	10,224	2,196	115,356
Fairfield	131,648	106,982	38,412	7,850	284,893
Fayette	100,516	80,693	22,160	1,256	205,105
Franklin	151,387	52,588	24,707	5,534	234,216
Fulton	124,966	25,301	42,916	2,112	195,275
Gallia	60,671	100,283	45,953	8,513	217,115
Geauga	64,299	109,281	37,672	1,863	213,115
Greene	132,584	28,082	34,089	6,215	210,970
Guernsey	78,458	148,765	52,037	716	279,976
Hamilton	66,566	18,097	8,952	4,476	98,081
Hancock	173,926	42,227	66,951	3,310	285,415
Hardin	129,601	33,657	42,558	2,176	207,992
Harrison	48,301	129,738	33,537	405	211,817
Henry	101,220	6,931	44,616	1,000	156,141
Highland	119,710	125,688	53,326	3,504	302,228
Hocking	42,164	101,066	49,342	3,762	196,334
Holmes	104,044	101,446	57,376	3,302	265,168
Huron	145,415	78,519	37,432	5,631	266,997
Jackson	44,294	105,608	35,704	13,195	198,801
Jefferson	64,191	77,779	32,584	6,805	181,359
Knox	120,885	122,266	51,308	434	294,893
Lake	57,128	37,845	17,405	2,459	114,837
Lawrence	42,870	45,351	38,251	28,445	160,917
Licking	136,279	176,513	55,405	4,129	375,725
Logan	142,570	44,868	49,974	1,865	232,277
Lorain	120,027	108,914	36,557	3,148	268,647
Lucas	65,871	12,227	19,914	2,198	100,210
Madison	97,641	100,095	16,576	1,090	215,402
Mahoning	104,782	74,981	34,544	2,202	216,509
Marion	116,382	46,957	27,510	724	191,574
Medina	111,351	68,120	36,583	311	217,265
Meigs	57,498	78,714	47,218	24,392	161,235
Mercer	142,225	10,253	70,079	5,015	227,572
Miami	150,874	6,645	26,224	1,576	188,786
Monroe	83,117	112,624	62,029	9,079	266,850
Montgomery	169,032	16,398	32,463	7,150	230,476
Morgan	57,258	124,037	43,470	2,101	226,866

LANDS OWNED IN 1888—Concluded.

Counties.	Acres cultivated.	Number acres pasture.	Number acres woodland.	Number acres lying waste.	Total number acres owned in 1888.
Morrow	102,153	76,494	38,881	1,108	218,636
Muskingum	95,378	194,387	61,105	3,454	362,174
Noble	61,324	133,580	37,540	1,366	233,810
Ottawa	65,190	17,974	19,959	6,236	107,895
Paulding	64,838	4,422	61,345	1,451	132,052
Perry	57,270	108,255	32,581	1,877	193,282
Pickaway	144,547	78,647	30,454	7,187	260,835
Pike	58,595	52,882	67,121	5,148	183,747
Portage	151,127	115,185	44,737	4,470	315,519
Preble	163,913	41,930	43,330	12,867	262,040
Putnam	180,923	14,347	63,911	1,505	210,686
Richland	169,713	55,174	72,325	8,839	306,051
Ross	116,009	104,157	61,945	11,813	294,673
Sandusky	146,787	24,403	34,448	4,473	210,111
Scioto	63,776	35,251	73,025	23,470	195,522
Seneca	218,160	31,638	56,698	1,059	307,555
Shelby	178,472	36,452	35,095	3,500	253,489
Stark	195,081	46,111	38,904	4,884	287,222
Summit	116,330	56,131	26,055	4,358	211,830
Trumbull	119,656	147,950	57,621	1,872	327,189
Tuscarawas	115,263	123,168	53,757	6,753	300,326
Union	103,352	66,530	34,047	743	204,672
Van Wert	118,385	14,657	58,305	12,349	203,696
Vinton	43,553	76,546	40,229	8,582	168,910
Warren	116,284	32,668	30,109	6,157	207,820
Washington	108,170	135,517	80,150	9,179	333,018
Wayne	200,862	34,687	51,409	2,007	299,385
Williams	134,111	30,605	51,302	1,892	217,910
Wood	173,304	36,136	66,137	1,318	276,895
Wyandot	126,891	64,917	37,367	1,199	230,365
Totals	9,866,184	6,152,866	3,859,561	438,766	20,323,029

WHEAT.

Counties.	Wheat.			
	Acres sown 1888.	Bushels produced.	No. of acres sown for crop of 1889.	Cost of com- mercial fertilizers for crop of 1889.
Adams	17,852	152,769	17,669	\$20,144
Allen	21,889	215,955	24,008	.....
Ashland	35,321	459,687	39,000	17,370
Ashtabula	12,690	190,289	15,808	47,100
Athens	9,315	89,766	11,821	10,469
Anglaize	34,262	304,360	34,136	.....
Belmont	22,193	272,446	22,280	11,384
Brown	20,042	170,401	21,611	8,025
Butler	50,163	652,562	52,208	81,870
Carrol	14,551	179,989	16,386	9,142
Champaign	44,914	293,769	40,923	10,781
Clarke	32,153	419,977	33,887	4,032
Clermont	16,997	128,111	16,858	15,634
Clinton	32,136	312,970	29,188	6,181
Columbiana	19,789	289,899	20,920	39,989
Coshocton	30,848	261,556	33,561	8,095
Crawford	27,087	334,334	28,459	55,639
Cuyahoga	9,798	200,640	11,989	379,619
Darke	62,703	607,826	60,288	1,319
Defiance	23,391	286,928	24,015	2,005
Delaware	19,253	87,310	22,305	2,709
Erie	16,385	260,967	48,941	4,598
Fairfield	40,368	285,743	39,057	6,651
Fayette	28,327	277,664	27,101	3,983
Franklin	42,288	525,465	39,379	1,806
Fulton	2,074	438,198	21,846	110
Gallia	19,224	165,603	16,405	14,927
Geauga	8,058	124,227	8,552	127,813
Greene	45,540	533,264	43,191	1,241
Guernsey	15,188	127,773	20,649	15,721
Hamilton	13,900	279,915	7,945	1,344
Hancock	33,937	384,448	39,526	249
Hardin	28,755	248,860	29,566	163
Harrison	11,943	142,041	11,691	84,888
Henry	24,105	362,760	28,420	.....
Highland	32,088	270,656	32,479	22,954
Hocking	8,438	72,075	9,128	10,821
Holmes	28,236	332,926	29,106	8,881
Huron	28,892	423,103	29,061	37,977
Jackson	8,707	93,360	9,863	36,418
Jefferson	12,145	141,122	13,505	4,411
Knox	32,277	312,224	32,559	10,718
Lake	5,197	84,756	8,591	6,450
Lawrence	10,802	59,378	8,903	744
Licking	36,273	318,193	36,041	15,712
Logan	35,143	234,235	35,947	836
Lorain	19,349	347,858	25,004	22,584
Lucas	12,242	20,753	13,215	1,520
Madison	25,309	290,991	24,762	98
Mahoning	13,798	215,745	16,259	29,762
Marion	20,895	129,010	26,131	778
Medina	28,762	401,207	24,127	55,225
Meigs	14,828	150,398	16,063	16,194
Mercer	28,269	244,710	26,951	.....
Miami	52,335	610,779	50,503	3,646

WHEAT—Concluded.

Counties.	Wheat.			
	Acres sown 1888.	Bushels produced.	No. of acres sown for crop of 1889.	Cost of com- mercial fertilizers for crop of 1889.
Monroe	18,958	197,709	20,114	\$14,826
Montgomery	44,648	561,535	49,862	10,908
Morgan	12,324	118,831	12,323	8,953
Morrow	14,098	107,021	15,036	7,623
Muskingum.....	25,731	214,811	25,259	20,781
Noble	14,269	134,307	15,197	6,020
Ottawa	13,169	236,352	13,530	.....
Paulding	11,789	110,293	12,587	.....
Perry	12,046	132,374	14,127	19,877
Pickaway	49,994	560,956	45,504	1,688
Pike	12,242	129,636	13,352	12,761
Portage.....	20,674	311,706	20,271	27,098
Preble	37,249	432,397	42,441	23,254
Putnam	29,250	417,580	30,667	294
Richland	36,338	601,910	37,120	16,988
Ross	36,009	493,954	41,973	7,436
Sandusky	40,496	692,821	39,655	75
Scioto	9,450	100,206	11,345	14,866
Seneca	55,970	820,894	56,663	17,613
Shelby	38,669	285,941	37,590	2,542
Stark	47,619	720,659	49,749	45,231
Summit	26,928	424,978	24,410	16,412
Trumbull	12,992	182,893	13,266	23,888
Tuscarawas	29,708	330,243	30,832	5,351
Union	19,031	87,307	19,879	255
Van Wert	18,665	155,709	26,158	51
Vinton	6,598	56,354	6,613	14,554
Warren.....	31,575	371,604	37,040	9,571
Washington.....	26,724	303,796	27,918	29,766
Wayne	52,519	749,671	53,537	32,655
Williams	23,673	361,623	24,751	362
Wood	33,834	618,529	35,367	2,125
Wyandot	25,783	314,443	27,730	716
Totals	2,230,416	26,160,994	2,359,633	\$1,675,270

RYE.

Counties.	Rye.			Commerc'l fertilizer—pounds used during past year.
	Acres sown, 1888.	Acres sown for 1889.	Bush. produced, 1888.	
Adams	122	187	388	1,409,050
Allen	392	609	4,774	.....
Ashland	384	527	3,757	966,559
Ashtabula	810	908	11,074	1,940,396
Athens	84	99	646	1,172,096
Auglaize	495	656	6,443	11,400
Belmont	120	156	1,274	554,857
Brown	811	1,347	4,396	539,865
Butler	121	164	787	58,625
Carroll	298	264	3,304	614,449
Champaign	288	329	5,462	338,244
Clarke	262	629	4,802	39,600
Clermont	691	997	3,932	364,778
Clinton	87	134	935	224,247
Columbiana	594	541	6,968	1,473,317
Coshocton	382	590	3,431	374,480
Crawford	398	421	5,348	323,765
Cuyahoga	1,809	1,012	38,116	2,224,210
Darke	559	828	8,470	43,122
Defiance	357	495	5,477	.....
Delaware	219	455	2,094	91,158
Erie	291	329	4,155	225,610
Fairfield	314	766	3,662	435,900
Fayette	364	465	6,975	139,297
Franklin	237	222	2,194	46,625
Fulton	1,276	1,183	21,161	2,170
Gallia	93	200	700	448,100
Geauga	170	177	1,861	1,356,890
Greene	167	747	1,645	87,100
Guernsey	294	344	2,379	822,741
Hamilton	1,302	1,157	19,666	.....
Hancock	2,841	3,497	40,083	7,200
Hardin	656	1,148	7,450	6,200
Harrison	136	83	1,033	191,350
Henry	3,857	4,453	85,302	600
Highland	510	589	4,354	1,039,616
Hocking	150	280	1,185	396,110
Holmes	479	708	4,333	568,297
Huron	629	451	9,956	1,484,130
Jackson	16	9	142	1,019,781
Jefferson	159	156	1,409	217,590
Knox	367	746	3,336	451,254
Lake	562	578	15,330	459,100
Lawrence	109	161	210	7,900
Licking	733	1,139	6,568	601,431
Logan	208	402	3,182	34,500
Lorain	114	78	1,811	1,173,317
Lucas	1,702	2,094	34,167	9,400
Madison	129	332	2,821	6,400
Mahoning	372	262	5,032	2,369,190
Marion	118	116	1,209	12,700
Medina	152	68	1,702	2,191,767
Meigs	113	70	1,044	1,214,313
Mercer	411	802	6,690	200
Miami	93	240	1,632	245,950
Monroe	241	255	2,453	845,649
Montgomery	307	482	2,779	741,145

Rye—Concluded.

Counties.	Rye.			Commerce'l fertilizer—pounds used during past year.
	Acres sown, 1888.	Acres sown for 1889.	Bush. produced, 1888.	
Morgan.....	76	164	897	543,540
Morrow	719	872	6,481	421,394
Muskingum.....	541	741	4,422	928,839
Noble	107	223	1,126	296,161
Ottawa	2,272	1,437	36,113	.....
Paulding	281	421	5,121	.....
Perry	283	318	2,321	1,365,580
Pickaway.....	311	318	2,954	186,100
Pike	46	68	224	418,507
Portage.....	137	105	1,893	1,833,840
Preble	124	104	1,159	1,582,220
Putnam	6,862	2,359	37,759	5,000
Richland	1,018	1,008	7,606	1,166,994
Ross	304	308	2,657	460,639
Sandusky	1,277	1,123	19,967	20,000
Scioto.....	70	172	1,075	418,116
Seneca.....	691	565	10,134	1,099,730
Shelby	152	347	2,682	188,380
Stark.....	99	92	641	1,457,556
Summit	199	178	2,320	985,400
Trumbull	381	412	4,890	1,467,549
Tuscarawas	340	247	2,763	251,000
Union	143	267	1,077	6,400
Van Wert	1,331	3,178	25,940	1,800
Vinton	82	36	813	386,853
Warren.....	293	414	2,449	271,055
Washington	278	263	2,484	1,495,790
Wayne	256	219	2,709	1,972,902
Williams	188	188	2,893	.....
Wood	3,057	3,640	67,033	49,500
Wyandot	578	1,099	8,434	41,800
Totals	51,451	57,012	700,826	50,946,386

BUCKWHEAT AND OATS.

Counties.	Buckwheat.		Oats.		
	Acres sown.	Bushels produced.	Acres sown — 1888.	Acres sown for crop of 1889.	Bushels produced.
Adams	16	111	4,409	5,514	51,215
Allen	151	1,149	13,675	13,591	459,301
Ashland	172	1,698	17,502	17,608	592,625
Ashtabula	985	19,383	24,869	19,841	1,206,664
Athens	59	429	2,787	2,846	38,091
Auglaize	225	2,649	14,299	14,128	485,571
Belmont	136	1,183	9,868	11,995	237,631
Brown	15	126	10,629	13,301	150,953
Butler	42	669	15,755	16,446	464,064
Carroll	187	1,958	13,642	14,320	424,401
Champaign	91	1,282	6,954	6,744	220,642
Clarke	40	463	6,112	5,913	182,441
Clermont	59	230	14,635	16,236	218,951
Clinton	63	819	601	10,073	230,701
Columbiana	160	1,852	19,209	19,729	606,535
Coshocton	380	4,111	11,639	11,761	309,165
Crawford	67	686	19,680	18,486	739,641
Cuyahoga	40	480	19,742	15,725	839,025
Darke	237	2,622	20,177	21,417	690,991
Defiance	156	1,530	15,330	14,975	547,231
Delaware	202	2,102	13,162	12,334	378,785
Erie	759	6,547	12,596	11,006	419,471
Fairfield	43	623	8,803	10,514	224,185
Fayette	3	56	4,614	5,783	128,421
Franklin	65	620	9,064	9,840	284,614
Fulton	330	3,988	16,003	15,464	658,731
Gallia	26	228	5,281	5,890	69,721
Geauga	329	5,526	14,719	13,644	507,211
Greene	7	59	8,082	7,573	245,201
Guernsey	279	2,550	9,569	11,820	237,841
Hamilton	17	290	7,638	6,943	160,161
Hancock	128	1,299	18,351	15,390	640,731
Hardin	160	2,103	13,278	13,395	486,261
Harrison	92	734	6,556	6,998	164,071
Henry	169	1,715	8,150	6,895	321,181
Highland	12	91	8,171	9,944	245,261
Hocking	72	002	2,949	3,133	42,131
Holmes	297	3,179	16,446	17,505	571,761
Huron	242	2,836	28,171	27,661	1,058,611
Jackson	35	301	4,015	3,923	48,431
Jefferson	39	510	9,011	10,493	255,481
Knox	291	2,549	14,170	11,531	446,291
Lake	84	1,573	7,698	10,507	300,631
Lawrence	11	95	4,898	6,187	49,661
Licking	289	2,488	13,207	14,818	331,641
Logan	280	3,525	11,676	8,065	392,031
Lorain	28	335	24,287	20,826	935,321
Lucas	451	4,853	9,402	8,466	342,511
Madison	65	112	5,340	7,389	167,871
Mahoning	175	133	17,429	17,759	616,931
Marion	88	1,060	17,627	15,298	650,331
Medina	35	459	22,133	19,490	679,611
Meigs	69	685	4,852	4,441	71,121

BUCKWHEAT AND OATS—Concluded.

Counties.	Buckwheat.		Oats.		
	Acres sown.	Bushels produced.	Acres sown—1888.	Acres sown for crop of 1889.	Bushels produced.
Mercer	129	1,319	20,105	21,716	692,416
Miami	39	735	10,827	11,767	396,397
Monroe	223	2,209	10,128	10,686	107,097
Montgomery	9	74	15,433	17,084	467,156
Morgan	85	791	3,636	4,232	78,929
Morrow	222	2,014	1,846	16,162	587,711
Maskingum	131	1,077	8,267	10,434	193,086
Noble	86	795	5,258	5,920	107,077
Ottawa	34	491	5,602	4,476	241,018
Paulding	61	545	6,774	7,434	282,379
Perry	57	498	2,885	2,765	57,936
Pickaway	123	1,036	4,481	6,803	121,700
Pike	20	194	5,685	5,941	67,661
Portage	132	2,017	18,029	17,869	673,365
Preble	17	152	16,142	16,838	467,370
Putnam	118	1,087	7,822	5,897	253,387
Richland	241	2,629	24,306	24,415	912,826
Ross	22	206	6,358	7,171	111,601
Sandusky	97	1,682	15,050	15,873	588,315
Scioto	26	198	5,987	6,011	77,304
Seneca	69	750	23,626	21,959	856,775
Shelby	179	1,874	17,845	17,969	608,247
Stark	65	695	26,502	27,238	1,073,173
Summit	21	332	16,879	17,502	684,903
Trumbull	587	8,152	22,104	20,159	838,095
Tuscarawas	268	2,389	18,454	20,650	559,899
Union	434	4,779	11,956	10,420	334,234
Van Wert	128	1,014	12,009	13,060	456,309
Vinton	45	591	2,884	8,254	33,012
Warren	39	453	13,642	14,995	338,848
Washington	225	2,387	10,056	10,541	153,592
Wayne	57	845	24,418	24,535	993,952
Williams	100	888	12,230	19,824	758,978
Wood	232	2,566	20,616	20,136	829,471
Wyandot	68	845	13,827	13,224	507,253
Totals	12,841	144,505	1,081,028	1,121,624	36,110,137

BARLEY AND CORN.

Counties.	Barley.			Corn.		
	Acres sown— 1888.	Acres sown for crop of 1889.	Bushels pro- duced.	Acres plant- ed—1888.	Acres planted for crop of 1889.	Bushels (shelled) produced.
Adams	11	15	85	31,798	32,622	850,227
Allen	143	105	2,140	29,042	28,722	1,088,825
Ashland	378	540	9,132	23,999	22,764	783,466
Ashtabula	697	978	24,741	15,919	11,497	618,373
Athens		16		15,378	15,925	427,334
Auglaize	872	1,045	15,405	39,608	38,469	1,586,027
Belmont	160	117	4,006	25,025	23,643	1,084,865
Brown				41,685	42,049	1,272,612
Butler	2,335	2,099	49,703	62,139	57,173	2,985,325
Carroll	5	7	100	13,958	13,389	560,329
Champaign	64	91	984	48,084	43,523	1,972,844
Clarke	125	129	4,183	42,682	41,878	1,878,791
Clermont	15	13	320	36,723	36,966	1,056,744
Clinton	24	18	735	55,894	53,038	2,386,129
Columbiana	5	12	10	19,707	18,284	748,564
Coshocton	11	22	124	27,095	25,455	1,017,263
Crawford	407	369	9,086	31,658	31,627	1,410,372
Cuyahoga	34	51	1,046	11,673	8,546	520,788
Darke	381	377	6,870	75,606	76,500	3,455,775
Defiance	1,031	1,605	26,364	24,847	25,754	850,351
Delaware	76	99	997	39,239	35,178	1,555,517
Erie	1,729	1,422	52,403	16,281	14,598	540,268
Fairfield	48	136	1,120	54,500	53,207	2,207,425
Fayette	15		140	59,214	59,731	2,602,081
Franklin	3	19	30	66,935	65,300	2,890,686
Fulton	509	813	13,933	24,442	23,946	983,503
Gallia	20	6		21,004	18,707	531,290
Geauga	45	80	916	9,042	80,227	384,763
Greene	222	279	3,225	54,776	53,544	2,458,170
Guernsey	26	31	590	21,430	20,347	824,438
Hamilton	833	679	21,580	22,519	27,575	828,251
Hancock	74	126	2,172	50,003	48,198	2,176,781
Hardin	53	11	393	37,685	34,896	1,380,187
Harrison	14	11	232	14,533	13,691	568,541
Henry	566	840	17,246	31,828	32,013	1,416,933
Highland	24	41	250	52,731	51,597	1,835,375
Hocking	9	8	155	13,999	14,538	428,714
Holmes	50	88	1,023	23,006	22,632	927,695
Huron	385	667	10,328	28,236	25,498	1,054,624
Jackson				13,689	13,705	352,065
Jefferson	88	92	1,372	13,114	12,275	563,570
Knox	46	42	957	32,517	28,513	204,214
Lake	412	390	12,682	7,092	4,838	271,995
Lawrence	7		50	18,606	17,895	427,388
Licking	160	268	3,340	49,867	48,539	2,034,329
Logan	59	42	1,262	42,261	38,006	1,789,566
Lorain	874	944	24,867	20,089	15,701	782,827
Lucas	396	794	12,581	17,723	15,501	705,463
Madison	2	32	20	67,629	70,453	2,957,599
Mahoning	32	13	739	14,975	13,659	554,061
Marion	342	637	6,494	43,719	40,801	1,815,334
Medina	83	93	2,081	20,559	20,875	834,247
Meigs	18	48	173	14,898	13,069	453,499

BARLEY AND CORN—Concluded.

Counties.	Barley.			Corn.		
	Acres sown — 1888.	Acres sown for crop of 1889.	Bushels pro- duced.	Acres plant- ed—1888.	Acres planted for crop of 1889.	Bushels (shelled) produced.
Mercer	168	285	2,260	43,681	43,711	1,865,390
Miami	702	568	11,832	54,107	54,206	2,425,950
Monroe	3	0	35	19,654	19,062	622,950
Montgomery	1,273	1,154	30,340	50,300	46,659	2,116,266
Morgan .....	.....	2	.....	16,337	16,913	650,166
Morrow	30	101	741	26,471	23,633	995,156
Muskingum	108	117	2,000	30,972	28,237	1,156,398
Noble	25	1	360	20,333	19,030	795,168
Ottawa	1,116	1,684	39,557	15,292	12,912	800,700
Paulding	23	105	375	18,792	22,357	674,234
Perry	6	13	103	16,152	15,525	546,763
Pickaway	77	92	880	80,902	82,019	3,383,168
Pike	228	171	1,967	23,974	25,276	742,497
Portage	16	51	752	15,510	12,707	609,141
Preble	285	262	4,990	47,300	44,363	1,952,858
Putnam	295	491	7,669	46,191	45,074	2,039,249
Richland	514	567	11,714	29,036	26,684	1,140,659
Ross	166	181	2,910	65,680	65,852	247,409
Sandusky	366	706	12,133	40,534	39,492	1,781,949
Scioto	129	142	2,235	22,811	20,664	634,921
Seneca	296	324	7,133	45,146	43,879	1,820,644
Shelby	715	689	9,443	43,294	43,902	1,830,369
Stark	348	192	6,154	28,248	29,009	1,275,498
Summit	48	37	1,396	17,131	14,993	1,769,772
Trumbull	20	73	590	14,648	11,952	608,284
Tuscarawas	81	75	1,852	23,144	20,455	869,487
Union	50	89	640	42,958	34,885	1,720,930
Van Wert	71	180	1,886	38,502	59,719	154,015
Vinton .....	.....	3	.....	11,276	11,978	278,082
Warren	804	802	23,215	47,881	46,401	2,271,062
Washington	4	.....	.....	23,935	23,116	727,427
Wayne	79	127	1,482	34,357	32,722	1,419,956
Williamson	223	162	5,524	26,840	27,306	1,016,510
Wood	787	1,904	27,264	59,631	57,392	2,779,229
Wyandot	273	234	8,999	36,916	35,950	1,516,802
Totals	23,247	27,983	576,815	2,879,497	2,853,212	111,155,506

BROOM-CORN AND MEADOWS.

Counties.	Broom-corn.		Meadow.	
	Number acres, 1889.	Pounds of broom-brush produced.	Acres.	Tons of hay.
Adams	7	2,500	10,563	7,455
Allen		850	14,483	12,744
Ashland	24	6,070	16,692	20,459
Ashtabula	9	15	36,277	42,996
Athens			20,649	19,467
Auglaize	100	41,500	10,398	10,140
Belmont	5	3,920	33,048	28,306
Brown	2	600	15,119	8,882
Butler	292	154,600	13,325	14,192
Carroll	1	300	29,304	27,636
Champaign	243	29,320	9,270	9,778
Clarke	2	600	13,206	13,650
Clermont	27	15,585	21,473	14,957
Clinton	4	3,025	13,104	13,872
Columbiana	1	150	35,819	37,550
Coshocton	1	50	24,678	23,916
Crawford	2	1,500	13,069	16,360
Cuyahoga			23,202	30,153
Darke	103	51,768	17,746	11,272
Defiance			10,943	12,863
Delaware	3	2,000	30,281	28,704
Erie	28		9,345	12,116
Fairfield	4	2,501	17,078	18,911
Fayette	134	25,064	10,997	9,742
Franklin	185	67,571	24,617	23,202
Fulton	5	4,500	12,586	14,991
Gallia	6	2,000	11,611	9,537
Geauga			16,466	20,429
Greene	12	8,000	12,352	13,193
Guernsey	1	1,450	32,443	28,353
Hamilton	29	9,000	14,760	15,271
Hancock	27		17,737	18,972
Hardin			19,115	22,155
Harrison			28,995	26,866
Henry			8,769	9,561
Highland	4	1,783	21,184	20,353
Hocking	1	200	14,770	11,152
Holmes	3	1,510	17,536	20,067
Huron	8	4,624	23,980	28,960
Jackson			16,292	11,493
Jefferson	2	180	22,559	18,585
Knox	6	2,400	26,826	30,443
Lake			12,651	14,936
Lawrence			10,082	4,559
Licking	38	21,800	39,910	42,054
Logan		200	13,449	13,003
Lorain		308	30,814	39,398
Lucas	1	360	10,876	13,710
Madison	2	4,000	17,038	16,339
Mahoning	10	875	17,635	19,253
Marion		80	14,041	14,917
Medina		30,000	18,672	24,041
Meigs	4	5,101	15,199	14,260
Mercer	1	70	11,765	10,433

BROOM-CORN AND MEADOWS—Concluded.

Counties.	Broom-corn.		Meadow.	
	Number acres, 1889.	Pounds of broom- brush produced.	Acres.	Tons of hay.
Miami.....	9	1,250	7,568	7,443
Monroe.....	10	2,185	23,161	19,893
Montgomery.....	137	135,370	14,702	15,402
Morgan.....	2	1,370	22,360	21,686
Morrow.....		111	24,523	29,834
Muskingum.....	5	558	38,109	34,463
Noble.....	2	600	30,060	22,090
Ottawa.....			6,893	10,027
Paulding.....	12		7,495	7,153
Perry.....			21,882	20,644
Pickaway.....	500	310,000	15,253	9,740
Pike.....			8,906	6,664
Portage.....	4	2,700	16,169	19,393
Preble.....	39	14,300	9,116	8,702
Rutnam.....			12,433	12,979
Richland.....			22,243	30,617
Ross.....	28	13,565	14,245	9,738
Sandusky.....	1	400	12,237	14,950
Scioto.....		2,000	10,443	7,449
Seneca.....	1	810	19,308	19,077
Shelby.....	1	1,000	8,144	6,878
Stark.....	20		25,719	35,690
Summit.....	1	100	17,082	22,563
Trambull.....	42	3,100	34,665	41,317
Tuscarawas.....	3	3,435	35,290	36,712
Union.....	20	1,200	20,967	19,983
Van Wert.....	26	2,400	12,159	13,397
Vinton.....			12,846	9,347
Warren.....	54	30,600	16,202	15,650
Washington.....	4	18	27,215	23,846
Wayne.....	6	3,370	19,610	25,993
Williams.....			16,398	18,832
Wood.....	6	1,250	15,913	17,937
Wyandot.....			14,638	14,909
Totals.....	2,170	1,039,622	1,617,853	1,647,115

CLOVER.

Counties.	Acres.	Tons of hay.	Bushels of seed.	Acres plowed under for manure.
Adams	2,984	972	323	172
Allen	12,041	10,020	17,778	185
Ashland	15,548	18,548	5,315	566
Ashtabula	6,665	9,529	187	257
Athens	1,750	1,419	76	32
Auglaize	8,724	8,441	7,335	757
Belmont	1,320	1,044	143	36
Brown	6,128	501	124	355
Butler	13,305	3,676	1,948	4,565
Carroll	2,658	2,877	271	16
Champaign	12,854	8,552	8,452	1,338
Clarke	6,738	6,002	8,507	1,551
Clermont	4,872	890	18	1,309
Clinton	2,549	834	605	768
Columbiana	7,971	9,361	218	71
Coshocton	6,141	6,084	2,299	381
Crawford	16,389	19,643	11,949	174
Cuyahoga	5,855	8,207	45	243
Darke	17,750	8,574	10,823	7,827
Defiance	10,251	9,717	7,731	717
Delaware	9,822	10,574	3,775	650
Erie	6,638	8,196	3,253	658
Fairfield	5,157	3,376	2,521	144
Fayette	3,046	966	534	862
Franklin	8,316	8,696	3,664	3,406
Fulton	10,772	11,902	15,599	271
Gallia	2,874	1,827	279	308
Geauga	8,388	12,422	482	126
Greene	10,478	2,403	2,364	3,445
Guernsey	1,508	1,378	322	52
Hamilton	3,693	3,304	224	1,110
Hancock	14,881	15,288	18,598	731
Hardin	7,362	7,875	7,543	430
Harrison	681	731	190	30
Henry	5,597	4,678	438	303
Highland	2,783	871	555	188
Hocking	790	500	216	80
Holmes	9,619	10,280	5,382	54
Huron	14,379	16,199	18,231	309
Jackson	211	76	.....	2
Jefferson	2,125	1,937	628	35
Knox	8,873	10,418	3,650	180
Lake	2,728	4,380	170	119
Lawrence	3,672	598	166	273
Licking	9,406	11,084	4,958	265
Logan	11,163	9,559	9,323	580
Lorain	6,594	9,198	882	125
Lucas	4,981	6,462	8,073	278
Madison	4,708	2,288	1,773	607
Mahoning	13,949	17,422	249	156
Marion	10,785	9,003	7,438	309
Medina	13,396	17,300	2,603	281
Meigs	2,101	1,304	52	359
Mercer	9,358	7,445	10,298	309
Miami	12,553	6,231	8,258	3,372
Monroe	1,011	943	595	19

CLOVER—Concluded.

Counties.	Acres.	Tons of hay.	Bushels of seed.	Acres plowed under for manure.
Montgomery	14,559	4,850	8,433	5,400
Morgan	2,181	2,293	518	44
Morrow	8,958	12,715	3,756	150
Muskingum	3,278	3,102	720	52
Noble	644	531	99	4
Ottawa	5,744	8,822	4,086	2,202
Paulding	4,272	2,791	5,838	618
Perry	1,185	1,147	411	.....
Pickaway	10,149	3,089	3,099	921
Pike	2,958	1,306	817	862
Portage	16,751	21,662	1,586	486
Preble	19,312	2,958	2,177	5,019
Putnam	9,204	8,679	12,558	390
Richland	20,150	18,667	7,344	453
Ross	8,134	2,902	2,016	2,797
Sandusky	14,373	16,107	10,240	1,562
Scioto	1,034	261	28	202
Seneca	19,843	21,442	18,642	1,455
Shelby	11,558	6,402	10,631	2,658
Stark	25,429	21,908	2,706	778
Summit	12,999	16,676	727	575
Trumbull	13,616	17,737	80	352
Tuscarawas	6,392	6,365	1,574	106
Union	7,401	8,870	3,589	64
Van Wert	6,047	6,860	7,245	612
Vinton	199	125	1	44
Warren	10,603	1,940	305	3,402
Washington	5,233	4,897	1,600	337
Wayne	25,099	32,548	6,704	770
Williams	11,623	11,503	19,430	1,602
Wood	8,087	8,383	15,080	208
Wyandot	11,710	11,924	10,623	673
Totals	725,614	659,347	376,111	76,544

TOBACCO, MILK, BUTTER AND CHEESE.

Counties.	Tobacco.		Milk.	Butter.		Cheese.	
	Acres planted.	Pounds produced.	Gallons sold for family use.	Pounds made in home dairies.	Pounds made in factories or creameries.	Pounds made in home dairies.	Pounds made in factories.
Adams	3,600	2,692,985	250	592,450			
Allen			63,195	507,319		20,845	
Ashland	2	755	15,750	479,434	55,240	178,700	220,440
Ashtabula	1	1,600	372,482	849,150	408,300	612,157	1,921,066
Athens	47	30,740	7,476	413,002	887	1,880	
Auglaize		67	23,345	466,298	372,891	3,613	
Belmont	972	937,453	197,167	250,394	3,760		
Brown	5,608	5,496,566	7,140	588,706		50	
Butler	607	167,726	181,265	658,733		6,866	
Carroll	1	60	94,941	577,976	3,000	28,500	30,000
Champaign	3	520	12,354	479,218	80,181	19,610	5,000
Clermont	75	92,179	224,310	506,770	45,400	20	
Clinton	44.8	3,539,476	37,646	674,463		700	
Columbiana	114	97,125	19,245	433,065	4,160	595	
Coshocton			405,249	794,614	1,000	50	559,540
Crawford	1	40	15,271	559,390	98,886	3,000	40,000
Cuyahoga			43,920	569,766	766	920	
Darke	2,795	2,667,879	3,194,747	1,299,706	39,550	189,233	152,150
Defiance	8	6,000	135,077	849,481	141,400	200	
Delaware		95	27,135	409,464			
Erie	1	300	49,263	654,563		350	
Fairfield	1	400	140,203	467,110	9,250	200	49,449
Fayette	5	5,115	67,370	686,133	58,000	29	
Franklin	1		19,372	272,570			
Fulton	108	30	822,613	787,940	21,950	290	
Gallia	411	292,925	16,401	368,097	279,154	350	642,489
Geauga			31,265	458,117	1,200	390	
Greene	227	206,112	78,113	421,445	424,358		1,458,038
Guernsey	243	222,250	71,377	503,128	47,240		1,000
Hamilton	237	249,370	27,495	616,951	1,304		
Hancock	5	320	5,213,477	862,937	9,045	12,050	
Hardin			126,039	743,464	1,600	33	
Harrison	2	1,200	28,890			500	
Henry			44,320	498,762			
Highland	450	287,244	10,695	448,275	300		
Hocking	1	300	462,745	313,495		150	
Holmes			6,517	15,850	55,178	7,700	151,000
Huron	1	100	465,733	629,373	190,606	218,592	491,200
Jackson	3	3,000	10,399	330,861		820	2
Jefferson			127,032	441,338		200	
Knox	2	500	18,155	652,984	265	400	14
Lake	10	20,300	287,956	278,788	12,000		90,109
Lawrence	130	109,880	43,235	259,407			
Licking			194,954	981,918	79,508	3,450	
Logan	18	19,012	78,930	514,884	149,646	7,900	
Lorain			196,768	653,908	215,523	24,488	2,206,447
Lucas	3	250	478,178	390,028	4,150		1,500
Madison	1	30	30,855	345,294	43,409	850	
Mahoning	2	250	804,708	703,083	15,450	23,475	219,920
Marion			11,855	514,422		50	
Medina	97	110,889	50,709	700,699	130,139	154,079	547,824
Meigs			69,820	428,948		9,765	
Mercer	3	2,800	10,920	650,369		400	
Miami	949	640,318	138,940	594,875	2,650	12,140	
Monroe	1,876	1,393,803	7,510	456,191	65,953	207,555	822,882
Montgomery	7,756	7,615,873	587,437	824,499	6,000	4,070	
Morgan	405	279,065	1,570	537,058	1,700	995	
Morrow			16,555	575,086	700	36	
Muskingum		237	73,379	813,991	400		
Noble	1,394	1,084,537	5,325	569,371	1,430	750	
Ottawa			9,710	276,250			
Paulding	1	500	86,380	230,631	1,000		
Perry	3	2,000	8,815	434,922	30,000		

TOBACCO, MILK, BUTTER AND CHEESE—Concluded.

Counties.	Tobacco.		Milk.	Butter.		Cheese.	
	Acres planted.	Pounds produced.	Gallons sold for family use.	Pounds made in home dairies.	Pounds made in factories or creameries.	Pounds made in home dairies.	Pounds made in factories.
Pickaway	1	400	9,920	396,919	1,870		
Pike	52	41,391	10,945	191,136			
Portage	1	60	414,822	766,376	218,795	9,600	1,426,420
Preble	1,531	1,502,099	28,800	685,119	104,000		
Putnam	1	1,000	16,192	492,908	164,808	8,945	
Richland		100	134,430	715,133	107,500	7,450	1,200
Ross	5	2,908	39,415	340,143	60,800	7,201	
Sandusky			33,825	468,732	108,900		1,000
Scioto	170	137,430	122,176	230,365		200	
Seneca		100	58,790	697,237	82,700		7,500
Shelby	36	29,499	118,770	445,128	62,820		
Stark		2,142	564,597	887,253	29,970	95,900	617,290
Summit			1,475,276	568,261		158,477	868,410
Trumbull			150,669	1,103,742	179,735	8,850	2,016,529
Tuscarawas	1	250	113,316	762,629	37,035	5,964	844,634
Union	1	350	15,120	363,944		12,900	
Van Wert	1	200	6,500	466,560		500	
Vinton	2	400	4,490	261,800			
Warren	1,240	935,044	45,113	568,792	200		
Washington	638	402,301	39,840	638,231		6,310	
Wayne	189	290,720	108,061	873,136	223,879	29,290	144,759
Williams	1	80	17,785	580,270	145,000		
Wood			86,004	691,759		700	
Wyandot			85,975	356,624	26,780	200	14,187
Totals	37,538	81,626,725	19,159,662	48,610,382	4,669,821	2,105,208	15,552,603

FLAX AND POTATOES.

Counties.	Flax.			Potatoes.		
	Acres.	Bushels seed.	Pounds fiber.	Acres planted 1888.	Acres for crops of 1889.	Bushels produced, 1888.
Adams	5			418	359	25,899
Allen	108	899		1,731	1,657	139,188
Ashland	1,625	16,504	878,395	1,445	1,091	178,665
Ashtabula	49	622	803	2,858	2,338	440,810
Athens				1,229	964	72,851
Auglaize	287	2,261	3,000	1,896	1,908	158,660
Belmont				1,599	1,501	135,104
Brown				1,302	1,172	83,044
Butler	12	90		1,340	1,428	98,715
Carroll	1	9		718	639	91,419
Champaign	508	2,794		1,122	983	113,704
Clarke	257	1,870	50,000	1,308	1,156	103,202
Clermont				2,243	2,130	95,646
Clinton	4	27		748	840	53,552
Columbiana	2			1,815	1,492	202,438
Coshocton	2	6		1,170	1,046	136,470
Crawford	614	6,503	41,100	2,550	1,700	218,095
Cuyahoga				6,148	4,892	714,394
Darke	1,827	16,876	378,968	2,660	2,486	220,405
Defiance				1,238	1,384	109,004
Delaware	39	242		1,206	1,114	107,443
Erie	18	300		3,603	2,902	314,281
Fairfield				1,698	1,701	121,941
Fayette				299	249	29,134
Franklin			93	2,822	2,617	185,329
Fulton				1,119	1,102	113,772
Gallia				902	943	64,269
Geauga	47	372	8,510	2,159	1,982	251,169
Greene	101	633	12,000	1,060	968	76,855
Guernsey				706	620	63,717
Hamilton				4,207	3,782	262,614
Hancock	594	3,666		1,996	1,895	185,007
Hardin	356	1,755		1,880	2,332	197,855
Harrison				449	363	57,717
Henry				1,178	1,159	111,228
Highland				1,094	752	133,186
Hocking				857	833	65,635
Holmes	1		28	1,202	1,093	149,814
Huron	541	7,058	481,707	2,883	2,655	234,541
Jackson	1	8	2	500	414	37,454
Jefferson				966	888	90,814
Knox	398	2,865	80	1,146	927	128,889
Lake				1,782	1,685	188,083
Lawrence				565	539	34,166
Licking	151	1,033		22,018	1,720	184,121
Logan	180	765		1,076	1,064	102,702
Lorain	143	1,846	141,206	2,646	2,274	308,182
Lucas	122	1,388		2,301	2,149	238,011
Madison				585	531	49,708
Mahoning	62	431	24,100	1,780	1,454	198,140
Marion	244	2,245	9,400	1,117	1,087	115,332
Medina	1,441	9,560	509,572	1,767	1,635	328,226
Meigs				1,476	731	102,761

FLAX AND POTATOES—Concluded.

Counties.	Flax.			Potatoes.		
	Acres.	Bushels seed.	Pounds fiber.	Acres planted, 1888.	Acres for crops of 1889.	Bushels produced, 1888.
Mexcer	152	1,154		1,156	1,118	93,904
Miami	2,398	18,144	755,100	1,217	1,198	90,865
Monroe				1,395	1,302	93,218
Montgomery	409	2,631	130,125	1,996	1,733	129,011
Morgan				737	597	64,300
Morrow	426	2,490	10,000	1,184	1,053	124,706
Muskingum	10	9		1,664	1,356	140,422
Noble				744	615	52,585
Ottawa				1,051	953	118,411
Paulding	10			729	973	57,702
Perry				934	844	73,021
Pickaway	17	15		955	959	75,593
Pike				755	660	51,571
Portage	166	1,733	52,900	3,945	3,281	385,579
Preble	673	2,667	73,600	851	559	57,830
Putnam				1,680	1,532	148,527
Richland	166	1,701	16,700	2,238	2,138	257,494
Ross				1,356	1,402	105,632
Sandusky				2,372	2,265	129,341
Scioto				1,026	938	80,050
Seneca	97	957		2,079	1,983	221,973
Shelby	1,476	10,506	313,300	1,165	1,263	101,113
Stark	4	18	500	2,618	2,364	328,664
Summit				2,454	2,120	336,449
Trumbull	448	4,301	258,700	2,847	2,255	338,041
Tuscarawas	4	10		1,909	1,640	220,547
Union	10	80		812	606	98,536
Van Wert	40	573	19,000	1,022	1,012	73,157
Vinton				616	533	47,856
Warren	39	118		784	859	63,473
Washington	1	2		2,250	1,999	139,481
Wayne	313	3,666	351,600	2,228	2,217	269,799
Williams	16	179		1,262	1,232	94,616
Wood	19	236		1,847	1,746	161,386
Wyandot	46	128	61	1,530	1,318	168,928
Total	16,680	133,946	4,520,550	139,991	125,939	13,217,162

SORGHUM AND MAPLE.

Counties.	Sorghum.			Maple.		
	Acres planted.	Pounds of sugar.	Gallons of syrup.	Pounds of sugar.	Gallons of syrup.	Number of trees tapped.
Adams	292		18,980	47	797	3,907
Allen	66		6,014	1,224	3,101	17,174
Ashland	18		1,612	45,937	15,403	92,890
Ashtabula				219,614	38,626	228,914
Athens	57		4,827	239	1,359	2,643
Auglaize	365		18,894	1,158	5,098	16,540
Belmont	147		11,298	10	1,058	2,611
Brown	173		12,192	40	271	920
Butler	41	60	3,111		1,050	4,182
Carroll	45	350	3,341	520	174	794
Champaign	124		5,652	8,574	7,155	23,766
Clarke	58		6,843	15	132	316
Clermont	123	6	5,266		463	1,929
Clinton	63	38	5,923	2,905	6,159	21,311
Columbiana	20		2,244	4,871	12,827	60,228
Coshocton	98	20	7,635	130	732	1,421
Crawford	125	72	7,171	2,142	7,032	31,028
Cuyahoga	15		614	93,655	35,208	19,006
Darke	389		31,595	670	4,129	20,812
Defiance	139		13,994	488	1,732	7,943
Delaware	62		4,834	1,363	9,536	53,842
Erie	17		1,741	2,740	1,895	10,391
Fairfield	82	22	5,936	775	1,721	7,826
Fayette	12		1,086		375	488
Franklin	79		2,871	235	530	445
Fulton	70	17	4,848	507	1,123	5,258
Gallia	741		69,821	384	115	792
Geauga				489,258	70,370	457,120
Greene	23		2,865	1,889	5,970	25,393
Guernsey	219		18,472	6	72	240
Hamilton	3		530	50	205	
Hancock	84	30	5,412	2,398	8,458	46,678
Hardin	63		4,790	1,192	1,793	8,327
Harrison	40		2,932	107	609	1,929
Henry	93		6,545		428	2,223
Highland	125		9,114	736	1,616	7,125
Hocking	112		8,650	210	231	471
Holmes	30		2,205	1,424	986	4,073
Huron	159		6,118	68,995	20,134	11,536
Jackson	159		12,778		220	155
Jefferson	66		4,173	100	1,347	4,640
Knox		846		8,401	4,426	43,121
Lake				25,030	4,021	32,143
Lawrence	900		107,417	120	120	
Licking	54		4,409	1,539	10,512	56,983
Logan	93		8,111	98,013	32,835	116,770
Lorain	83	380	4,171	56,921	13,388	88,420
Lucas	17		1,029	237	125	284
Madison	535		535		220	710
Mahoning	6		538	20,781	24,863	127,497
Marion	59		4,412	117	1,110	5,136

SORGHUM AND MAPLE—Concluded.

Counties.	Sorghum.			Maple.		
	Acres planted.	Pounds of sugar.	Gallons of syrup.	Pounds of sugar.	Gallons of syrup.	Number of trees tapped.
Medina.....	3	.....	215	136,311	37,814	286,567
Meigs	175	.....	16,023	.....	125	758
Mercer	240	2	23,363	.....	61	155
Miami	156	.....	16,467	927	2,642	14,286
Monroe.....	601	10	42,113	1,214	114	1,278
Montgomery	128	.....	10,798	265	4,160	21,724
Morgan	121	.....	9,269	62	182	695
Morrow	24	.....	3,417	16,933	15,245	87,013
Muskingum	95	.....	7,689	8	352	1,097
Noble	307	.....	26,915	.....	104	334
Ottawa	19	.....	1,056	20	106	.....
Paulding	66	12	6,702	10	110	540
Perry	55	50	3,637	534	2,706	11,265
Pickaway	26	60	2,055	.....	503	1,465
Pike	213	.....	13,100	191	319	2,051
Portage.....	2	.....	141	61,061	87,834	351,991
Preble	97	.....	8,715	100	2,902	14,448
Putnam	212	.....	16,260	357	1,619	6,881
Richland	18	.....	1,055	14,433	17,101	93,283
Ross	64	69	6,477	50	1,575	638
Sandusky	49	.....	495	778	1,477	7,805
Scioto	287	.....	25,319	86	58	20
Seneca	66	.....	6,102	2,713	8,113	40,635
Shelby	225	.....	17,373	114	1,202	6,340
Stark	22	.....	1,880	4,230	10,352	55,500
Summit	2	.....	188	12,855	11,328	52,335
Trumbull	11	.....	724	85,754	40,307	186,700
Tuscarawas	66	.....	5,359	104	446	1,084
Union	101	.....	7,349	19,185	5,252	38,254
Van Wert	136	.....	11,627	266	72	369
Vinton	194	.....	21,823	337	503	1,855
Warren	38	.....	2,376	930	2,597	10,575
Washington.....	490	30	32,383	.....	123	351
Wayne	27	.....	2,539	12,959	7,409	44,172
Williams	33	.....	2,516	3,355	6,721	41,446
Wood	48	.....	2,136	321	2,041	9,010
Wyandot	55	.....	3,571	713	2,996	13,508
Totals	10,814	2,074	832,776	1,542,943	639,031	3,084,249

BEES, EGGS.

Counties.	Bees.		Eggs.	
	Number hives.	Pounds honey.	Number dozens produced.	Number dozens shipped beyond State.
Adams	1,473	21,211	469,303	35,050
Allen	1,665	18,991	548,895	.....
Ashland	1,114	6,839	521,638	.....
Ashtabula	1,181	56,557	462,816	4,400
Athens	920	17,688	372,994	12,000
Auglaize	885	6,973	619,110	418,780
Belmont	1,918	21,325	603,359	23,802
Brown	971	6,568	605,946	.....
Butler	674	2,437	512,490	.....
Carroll	707	5,107	375,496	5,000
Champaign	987	10,722	494,498	2,200
Clarke	894	18,059	318,694	.....
Clermont	1,212	5,133	506,360	.....
Clinton	748	1,531	441,187	265,299
Columbiana	790	4,937	595,624	1,025
Coshocton	1,179	11,964	598,406	.....
Crawford	1,410	10,864	605,420	126,500
Cuyahoga	2,578	9,523	366,732	26,262
Darke	2,102	18,750	936,415	180,060
Defiance	1,397	10,992	493,982	240,200
Delaware	819	3,012	686,007	.....
Erie	445	63,164	199,065	.....
Fairfield	1,199	3,644	639,137	57,187
Fayette	511	1,904	363,306	250,000
Franklin	650	3,521	718,007	47,480
Fulton	739	8,676	555,834	.....
Gallia	1,037	12,114	415,260	.....
Geauga	1,078	18,380	386,362	.....
Greene	645	2,580	465,990	.....
Guernsey	1,048	14,161	516,101	89,110
Hamilton	559	3,259	335,048	8
Hancock	2,502	27,423	651,676	380
Hardin	2,034	18,582	586,092	.....
Harrison	947	7,481	376,383	90,220
Henry	542	6,585	577,790	26,000
Highland	837	6,815	568,888	28,000
Hocking	685	7,404	273,550	.....
Holmes	904	6,418	688,996	400
Huron	1,244	14,786	542,972	.....
Jackson	500	5,644	251,855	8,000
Jefferson	452	1,801	232,050	9,079
Knox	723	4,765	581,178	.....
Lake	240	3,308	118,896	.....
Lawrence	1,072	14,928	184,267	5,285
Licking	1,387	4,487	916,543	260,700
Logan	1,313	8,733	571,174	24,725
Lorain	1,429	11,299	467,770	50
Lucas	564	8,366	293,796	20
Madison	386	527	444,735	.....
Mahoning	1,280	7,482	431,921	1,125
Marion	853	5,861	617,070	.....
Medina	838	9,619	441,969	210
Meigs	1,133	15,136	404,163	4,000
Mercer	711	3,979	739,191	.....
Miami	902	13,413	424,556	.....

BEES, EGGS—Concluded.

Counties.	Bees.		Eggs.	
	Number hives.	Pounds honey.	Number dozens produced.	Number dozens shipped beyond State.
Monroe	1,339	18,672	566,008	177,387
Montgomery	749	7,851	615,026	.....
Morgan	1,579	19,603	608,969	32,500
Morrow	575	1,652	632,336	3,025
Muskingum	1,319	17,734	668,115	1,500
Noble	1,207	16,978	568,468	4,180
Ottawa	399	4,532	202,276	.....
Paulding	813	7,402	313,603	25
Perry	538	3,970	357,113	.....
Pickaway	474	1,730	547,943	44,000
Pike	579	6,900	246,897	1,000
Portage	1,464	16,866	447,908	606,100
Preble	952	6,898	477,043	327
Putnam	1,103	4,553	703,022	57,199
Richland	1,000	7,076	589,150	.....
Ross	1,095	11,059	373,307	13,600
Sandusky	1,058	12,556	574,262	2,785
Scioto	1,216	11,158	225,121	5,040
Seneca	1,355	12,208	576,970	.....
Shelby	1,159	11,075	514,641	500
Stark	1,477	12,245	759,806	160,235
Summit	672	5,046	435,958	.....
Trumbull	1,551	19,085	535,516	1,125
Tuscarawas	1,457	12,677	563,007	25,108
Union	706	4,314	517,369	200
Van Wert	796	6,247	628,833	5,600
Vinton	582	6,875	256,322	.....
Warren	407	2,039	441,903	40
Washington	1,164	15,233	775,656	5,980
Wayne	1,602	12,813	662,692	80,350
Williams	1,252	10,663	638,884	68,852
Wood	1,250	21,362	808,270	50,050
Wyandot	1,105	11,353	446,377	57,676
Totals	91,007	956,863	44,698,932	3,646,941

GRAPES AND WINE AND SWEET POTATOES.

Counties.	Grapes and wine.				Sweet potatoes.	
	Acres planted in 1888.	Acres in vineyard in 1888.	Pounds of grapes gathered in 1888.	Gallons wine pressed in 1888.	Acres planted.	Bushels produced.
Adams.....		7	800	227	24	1,470
Allen.....		8	25,888	324		106
Ashland.....	2	9	39,140	344	4	481
Ashtabula.....	40	185	465,765	712		3
Athens.....	2	5	32,000	10	12	925
Auglaize.....	6	1	1,170	4,835	4	98
Belmont.....	21	82	422,280	5,080	6	184
Brown.....	12	38	14,300		16	970
Butler.....	17	27	29,640	2,532	42	3,263
Carroll.....			800	10	1	55
Champaign.....	2	29	44,490	2,725	18	1,129
Clarke.....	13	27	56,802	523	21	1,824
Clermont.....	33	295	3,109,170	14,208	108	5,850
Clinton.....	125		12,690		28	2,444
Columbiana.....	3		9,510	663		4
Coshocton.....	5	20	255,301	2,570	4	130
Crawford.....	3	22	32,055	2,565	2	170
Cuyahoga.....	290	12,880	7,662,105	33,404		
Darke.....	4	18	73,533	635	63	4,362
Defiance.....	2	1	14,760	206	3	176
Delaware.....		4	29,650	315	2	156
Erie.....	175	1,511	5,033,767	266,580	8	1,200
Fairfield.....	13	129	187,690	2,916	29	2,383
Fayette.....		13	12,855	115	15	297
Franklin.....	16	22	28,250	90	2	319
Fulton.....	1	13	6,852	1,381	6	448
Gallia.....		5	3,900		24	1,735
Geauga.....	5	120	56,800	100		
Greene.....		3	30,020	297	15	1,720
Guernsey.....		7	30,348	270		
Hamilton.....	119	187	712,857	6,169	172	13,260
Hancock.....	3	11	42,775	663	15	893
Hardin.....			35,250	467		235
Harrison.....	16	12	8,155	6		
Henry.....	5	3	3,380	165		
Highland.....					13	1,560
Hocking.....	12	25	15,685	225	125	3,162
Holmes.....	8	42	40,365	1,105		
Huron.....	1	3	13,231	182	2	121
Jackson.....	1	2	2,300		16	1,992
Jefferson.....		17	19,570	1,080	1	200
Knox.....		14	22,300	100	1	34
Lake.....	68	827	3,197,456	16,658		
Lawrence.....		3	9,190		75	9,436
Licking.....		99	76,273	218	10	326
Logan.....	1	2	25,870	154	5	703
Lorain.....	32	426	1,087,700	1,544	3	679
Lucas.....	28	213	240,364	7,530	2	76
Madison.....	1	585	40,590	330	1	401
Mahoning.....	2	4	31,790	446	5	239

GRAPES AND WINE AND SWEET POTATOES—Concluded.

Counties.	Grapes and wine.				Sweet potatoes.	
	Acres planted in 1888.	Acres in vineyard in 1888.	Pounds of grapes gathered in 1888.	Gallons wine pressed in 1888.	Acres planted.	Bushels produced.
Marion.....	5	41,216	1,005	1	107	
Medina.....	6	4,200	4,402	6,201	121	
Meigs.....	4	6,150	132	20	1,632	
Mercer.....	1	5	32,890	1,114	1	30
Miami.....	3	4	62,310	212	25	3,928
Monroe.....	1	20	19,480	4,548	1	63
Montgomery.....	5	46	124,898	8,655	33	3,648
Morgan.....	2	6,060	278	19	2,219	
Morrow.....	3	7,040	7	9	130	
Muskingum.....	3	45	42,904	1,665	54	6,337
Noble.....	27	18	34,700	1,381	1	60
Ottawa.....	100	11,990	6,111,744	295,818		
Paulding.....	2	1,300	5	3	65	
Perry.....	1	24	20,300	510	31	2,215
Pickaway.....	1	2	9,675	20	5	248
Pike.....	3	8	226,665	208	10	411
Portage.....	8	7,175	30		4	
Preble.....	8	22,220	121	28	2,203	
Putnam.....	2	16,875	398	3	107	
Richland.....	1	7	16,988	112	25	
Ross.....	15	51	64,663	1,926	7	1,507
Sandusky.....	1	25	74,817	7,900	6	732
Scioto.....	30	34	3,342	438	43	3,306
Seneca.....	5	18	40,780	1,589	11	187
Shelby.....	6	7,214	100	8	417	
Stark.....	3	55	84,525	1,670	7	759
Summitt.....	6	8	44,720	107	1	330
Trumbull.....	3	5	26,070	1,125	1	90
Tuscarawas.....	3	16	38,280	2,373	3	143
Union.....	1	24,760	303	5	202	
Van Wert.....	1	15	8,595	159	7	120
Vinton.....	4,300	80	16	1,323		
Warren.....	4	3	19,408	249	52	4,443
Washington.....	9	11	7,800	1,713	161	22,811
Wayne.....	3	28	159,540	4,429	9	705
Williams.....	9	22,530	127	2	181	
Wood.....	9	56	79,030	1,061		
Wyandot.....	3	6	13,950	147	2	108
Totals.....	1,339	34,689	30,886,448	728,595	1,488	123,974

ORCHARDS.

Counties.	Orchards.					
	Acres occupied.	Apples— bushels produced.	Peaches— bushels produced.	Pears— bushels produced.	Cherries— bush- els pro- duced.	Plums— bushels produced
Adams.....	4,166	324,878	15,574	3,322	2,849	1,444
Allen.....	3,208	208,615	3,237	1,421	1,087	173
Ashland.....	4,139	216,557	18,200	1,287	590	517
Ashtabula.....	5,037	259,166	1,901	1,658	623	151
Athens.....	6,008	363,325	42,261	1,098	4,984	6,503
Auglaize.....	2,246	93,992	352	1,564	180	.....
Belmont.....	6,229	854,008	22,242	5,265	2,380	3,057
Brown.....	3,963	349,913	8,367	5,459	2,021	801
Butler.....	2,717	135,708	4,644	7,135	2,655	367
Carroll.....	4,786	404,127	43,115	1,152	945	1,504
Champaign.....	2,989	203,280	7,300	3,935	3,470	4,302
Clarke.....	2,055	214,644	5,252	3,994	1,651	1,351
Clermont.....	7,840	339,809	44,647	18,881	7,280	1,407
Clinton.....	2,536	146,528	8,728	5,203	2,278	2,922
Columbiana.....	7,582	425,667	34,392	4,049	1,962	4,229
Coshocton.....	5,887	565,289	75,051	1,439	536	407
Crawford.....	4,236	225,940	1,024	1,204	283	130
Cuyahoga.....	5,688	243,261	5,841	6,974	789	362
Darke.....	4,347	218,326	3,551	7,001	5,095	437
Defiance.....	3,163	162,262	265	1,238	129	35
Delaware.....	4,053	312,454	1,774	705	195	617
Erie.....	3,142	179,471	16,627	1,982	384	364
Fairfield.....	5,004	581,231	31,496	4,227	4,778	26,396
Fayette.....	1,746	138,171	10,026	2,756	1,431	2,441
Franklin.....	4,641	503,769	7,969	2,935	502	3,247
Fulton.....	4,574	197,300	410	781	202	97
Gallia.....	4,583	335,616	14,919	618	3,323	2,208
Geauga.....	3,850	143,077	1,202	2,030	107	95
Greene.....	2,930	184,447	14,267	4,859	2,677	1,651
Guernsey.....	7,030	580,085	77,643	2,185	852	1,237
Hamilton.....	3,535	145,148	12,725	21,722	9,408	517
Hancock.....	5,273	320,541	2,283	2,986	1,554	292
Hardin.....	3,378	148,563	853	1,032	524	138
Harrison.....	3,803	356,506	29,799	1,225	548	566
Henry.....	3,093	152,631	521	1,040	240	40
Highland.....	4,755	437,919	24,862	7,457	3,674	4,546
Hocking.....	4,027	347,860	43,079	1,852	6,082	5,625
Holmes.....	4,792	457,751	34,897	764	2,551	405
Huron.....	21,363	376,713	8,634	1,315	869	394
Jackson.....	3,508	286,645	18,084	473	2,773	874
Jefferson.....	3,920	396,553	11,399	2,068	536	2,669
Knox.....	4,633	329,860	13,027	528	436	388
Lake.....	3,288	286,205	10,093	3,249	178	204
Lawrence.....	5,021	195,438	9,951	460	1,995	607
Licking.....	6,444	588,514	48,275	3,076	1,519	7,118
Logan.....	2,791	163,108	4,198	3,032	1,443	2,103
Lorain.....	4,929	295,766	21,266	11,688	259	129
Lucas.....	2,943	152,718	4,408	1,840	272	136
Madison.....	1,850	157,352	7,214	1,976	761	1,777
Mahoning.....	5,179	267,847	24,932	3,149	488	1,686
Marion.....	2,472	171,582	659	767	85	45
Medina.....	4,874	214,756	5,819	1,346	207	246
Meigs.....	6,139	414,034	18,534	1,382	6,711	4,243
Mercer.....	2,358	101,883	498	836	359	21

ORCHARDS—Continued.

Counties.	Orchards.					
	Acres occupied.	Apples—bushels produced.	Peaches—bushels produced.	Pears—bushels produced.	Cherries—bushels produced.	Plums—bushels produced.
Miami	2,552	148,993	2,146	4,509	4,871	518
Monroe	6,475	791,288	21,696	3,289	2,596	4,016
Montgomery	3,433	222,690	4,561	9,748	5,371	930
Morgan	5,223	512,681	40,569	4,437	6,732	8,692
Morrow	4,678	284,472	4,587	2,250	193	569
Muskingum	7,711	707,366	90,786	5,503	3,210	2,317
Noble	4,677	558,679	36,332	3,903	2,133	3,137
Ottawa	4,354	62,385	160,861	3,212	183	2,026
Paulding	1,719	83,015	52	283	45	1
Perry	3,569	401,694	19,873	2,954	1,861	8,986
Pickaway	2,958	294,925	14,770	2,985	1,089	6,242
Pike	3,428	245,582	26,359	1,387	1,690	2,117
Portage	4,974	249,619	15,889	1,904	843	709
Preble	2,107	114,970	3,917	5,542	2,096	670
Putnam	2,995	212,354	1,357	1,763	1,453	97
Richland	6,012	487,678	13,523	2,208	667	672
Ross	5,130	382,640	69,432	5,335	3,107	8,002
Sandusky	4,446	246,561	10,151	1,843	947	145
Scioto	4,316	157,156	12,296	599	1,595	1,296
Seneca	5,475	298,901	4,393	3,415	1,689	716
Shelby	2,424	98,931	881	1,165	902	413
Stark	6,533	505,220	39,570	4,232	4,706	2,099
Summit	4,630	315,855	9,480	1,819	1,274	420
Trumbull	7,182	244,740	7,000	1,599	224	308
Tuscarawas	6,989	690,524	6,989	1,885	1,286	1,798
Union	2,638	230,065	1,295	1,326	875	486
Van Wert	2,839	143,773	338	733	924	10
Vinton	3,296	247,230	28,142	791	3,288	2,520
Warren	51,581	129,372	9,033	11,010	3,713	693
Washington	11,010	922,748	25,184	1,922	4,616	8,506
Wayne	5,855	446,305	29,018	1,657	2,772	736
Williams	4,525	206,258	123	1,076	506	74
Wood	4,857	216,296	2,990	2,098	864	275
Wyandot	3,269	182,363	2,502	1,478	747	184
Totals	448,604	26,720,278	1,594,892	271,480	168,777	173,621

WOOL, MILCH COWS, STALLIONS AND DOGS.

Counties.	Wool.	Milch cows.	Stall'ns.	Dogs.
	Pounds shorn in 1888.	Number owned in 1888.	Number owned in 1888.	Total number.
Adams	54,340	4,437	47	1,818
Allen	91,113	5,554	52	1,427
Ashland	217,202	7,614	67	1,210
Ashtabula	92,256	16,379	73	1,455
Athens	446,880	4,178	28	2,296
Auglaize	57,976	6,611	64	1,908
Belmont	722,128	7,759	52	2,629
Brown	40,386	6,035	64	2,054
Butler	24,683	7,218	69	2,815
Carroll	595,010	5,779	58	1,713
Champaign	90,687	6,171	87	2,275
Clarke	227,870	5,705	62	1,064
Clermont	16,381	6,154	39	988
Clinton	95,716	4,592	67	1,708
Columbiana	410,499	10,399	70	2,963
Coshocton	651,740	6,655	60	1,185
Crawford	206,331	6,392	53	1,943
Cuyahoga	110,208	22,621	37	3,606
Darke	16,115	11,513	79	3,429
Defiance	57,990	5,906	51	922
Delaware	425,924	6,166	96	2,113
Erie	99,307	4,047	93	490
Fairfield	124,415	7,419	68	2,691
Fayette	77,941	3,899	56	1,808
Franklin	106,064	9,062	66	1,287
Fulton	173,016	7,375	46	1,182
Gallia	40,396	4,888	43	2,134
Geauga	84,321	13,030	40	1,011
Greene	132,334	6,777	77	2,518
Guernsey	688,662	6,409	70	650
Hamilton	7,990	8,887	27	1,764
Hancock	197,009	10,577	77	2,373
Hardin	264,526	6,374	61	1,809
Harrison	884,020	4,643	71	1,624
Henry	36,497	517	25	779
Highland	79,605	6,383	73	1,973
Hocking	193,223	3,828	25	1,727
Holmes	202,483	6,995	63	2,426
Huron	312,262	7,601	74	1,231
Jackson	40,946	4,295	17	1,472
Jefferson	491,404	4,711	62	2,023
Knox	584,062	5,705	95	1,367
Lake	70,733	3,531	22	837
Lawrence	8,743	2,880	25	2,294
Licking	1,044,022	9,344	99	3,500
Logan	253,018	6,124	74	2,195
Lorain	136,409	15,209	41	538
Lucas	23,530	5,200	23	1,143
Madison	425,750	4,438	107	1,203
Mahoning	236,233	7,875	95	2,232
Marion	284,412	4,933	46	820
Medina	254,425	8,841	42	423

WOOL, MILCH COWS, STALLIONS AND DOGS—Concluded.

Counties.	Wool.	Milch cows.	Stall'ns.	Dogs.
	Pounds shorn in 1888.	Number owned in 1888.	Number owned in 1888.	Total number.
Meigs.....	503,367	4,097	23	304
Mercer.....	35,095	7,152	52	1,883
Miami.....	26,617	6,378	66	2,922
Monroe.....	230,101	8,643	48	2,264
Montgomery.....	12,769	9,586	57	1,699
Morgan.....	557,371	4,773	48	1,543
Morrow.....	500,429	5,519	101	1,382
Muskingum.....	791,300	8,437	51	1,042
Noble.....	470,279	5,700	48	1,973
Ottawa.....	52,238	4,202	27	1,064
Paulding.....	22,040	3,703	47	1,514
Perry.....	304,258	4,356	23	1,853
Pickaway.....	54,848	5,960	63	1,036
Pike.....	22,806	2,648	30	1,197
Portage.....	141,218	11,999	71	2,233
Preble.....	24,748	5,678	70	1,907
Putnam.....	57,158	6,761	44	.....
Richland.....	220,408	8,161	50	2,022
Ross.....	57,009	5,373	53	645
Sandusky.....	114,237	7,801	109	1,009
Scioto.....	6,969	3,444	9	1,182
Seneca.....	250,829	9,238	60	2,092
Shelby.....	35,671	6,666	45	2,218
Stark.....	164,491	11,775	85	4,165
Summit.....	72,891	12,935	52	2,450
Trumbull.....	190,027	14,132	122	1,513
Tuscarawas.....	376,733	11,242	76	3,018
Union.....	261,388	4,679	73	1,976
Van Wert.....	46,121	5,814	61	1,557
Vinton.....	176,820	2,957	23	599
Warren.....	58,009	6,080	66	1,791
Washington.....	426,352	7,592	38	3,241
Wayne.....	144,120	9,899	130	3,011
Williams.....	157,092	6,399	80	1,422
Wood.....	164,195	8,762	96	3,019
Wyandot.....	382,729	5,307	66	1,655
Totals.....	19,319,926	619,483	5,241	155,446

SHEEP.

Counties.	Killed by dogs.		Injured by dogs.	
	Number.	Value.	Number.	Value.
Adams.....	217	\$780	118	\$320
Allen.....	183	486	245	196
Ashland.....	368	1,338	296	638
Ashtabula.....	220	804	117	301
Athens.....	757	1,910	552	657
Auglaize.....	349	1,246	215	402
Belmont.....	737	2,487	652	874
Brown.....	295	1,229	198	449
Butler.....	256	1,127	89	670
Carroll.....	433	1,217	358	566
Champaign.....	232	838	1,132	635
Clarke.....	546	1,491	959	4,267
Clermont.....	203	778	202	616
Clinton.....	552	1,834	355	608
Columbiana.....	638	1,914	437	1,033
Coshocton.....	467	1,234	562	534
Crawford.....	315	945	73	145
Cuyahoga.....	227	908	114	279
Darke.....	238	1,110	171	432
Defiance.....	285	574	147	297
Delaware.....	581	1,692	296	469
Erie.....	230	618	135	42
Fairfield.....	354	1,122	1,038	777
Fayette.....	385	2,322	313	651
Franklin.....	572	2,014	641	1,574
Fulton.....	185	752	528	551
Gallia.....	212	720	126	158
Geauga.....	131	572	277	273
Greene.....	1,008	3,583	437	821
Guernsey.....	557	1,490	368	583
Hamilton.....	116	573	50	133
Hancock.....	933	3,527	800	1,694
Hardin.....	376	1,004	477	976
Harrison.....	231	717	253	476
Henry.....	182	581	81	241
Highland.....	454	1,614	366	760
Hocking.....	309	757	124	282
Holmes.....	333	1,095	408	585
Huron.....	375	1,190	109	215
Jackson.....	219	660	79	151
Jefferson.....	722	2,166	334	515
Knox.....	285	904	647	909
Lake.....	97	357	55	93
Lawrence.....	80	225	20	45
Licking.....	804	2,011	482	905
Logan.....	712	2,734	584	848
Lorain.....	191	632	140	282
Lucas.....	198	733	160	272
Madison.....	433	1,542	365	701
Mahoning.....	344	1,179	593	1,012
Marion.....	486	1,340	222	310
Medina.....	677	873	200	397
Meigs.....	249	456	203	377
Mercer.....	180	666	92	162
Miami.....	164	575	142	410
Monroe.....	440	1,269	138	160
Montgomery.....	163	775	117	338

SHEEP—Concluded.

Counties.	Killed by dogs.		Injured by dogs.	
	Number.	Value.	Number.	Value.
Morgan	377	\$903	159	\$196
Morrow	214	574	194	372
Muskingum	472	1,418	490	738
Noble	288	863	115	172
Ottawa	101	300	36	51
Paulding	221	591	174	203
Perry	766	1,755	153	324
Pickaway	343	1,142	177	402
Pike	71	174	35	38
Portage	182	729	105	345
Preble	381	1,754	144	301
Putnam	350	1,090	151	275
Richland	258	934	172	340
Ross	485	2,135	349	772
Sandusky	312	750	146	326
Scioto	100	276	110	170
Seneca	429	1,929	238	438
Shelby	474	1,372	395	614
Stark	195	843	419	1,499
Summit	258	1,025	212	458
Trumbull	271	963	835	1,171
Tuscarawas	938	2,835	242	498
Union	586	1,884	402	856
Van Wert	493	1,534	471	838
Vinton	141	392	34	56
Warren	164	944	158	372
Washington	489	1,146	151	279
Wayne	393	1,585	488	980
Williams	163	587	580	994
Woods	423	1,517	220	540
Wyandot	262	619	305	416
Totals	32,080	\$103,531	26,152	\$48,503

DOMESTIC ANIMALS DIED FROM DISEASES.

Counties.	Hogs.		Sheep.	
	Number.	Value.	Number.	Value.
Adams..	506	\$2,472	507	\$1,155
Allen.....	1,413	8,294	317	1,525
Ashland	323	2,034	625	1,639
Ashtabula	205	1,685	463	1,750
Athens	168	895	2,214	3,725
Auglaize.....	4,582	20,296	404	2,967
Belmont	390	1,835	2,807	5,739
Brown	1,093	5,948	280	885
Butler	2,254	11,435	158	832
Carroll.....	189	1,157	2,303	4,908
Champaign.....	4,155	16,709	678	1,302
Clarke	2,134	12,163	322	1,259
Clermont	743	3,461	146	675
Clinton	1,982	50,216	430	1,246
Columbiana.....	179	1,388	1,107	2,672
Coshocton.....	297	1,789	2,820	5,701
Crawford.....	6,049	6,411	478	1,188
Cuyahoga.....	146	1,013	238	782
Darke	7,023	40,198	270	1,343
Defiance	641	2,496	284	532
Delaware	475	2,604	1,505	3,320
Erie	200	842	250	716
Fairfield.....	2,337	12,640	560	1,519
Fayette.....	12,095	53,201	383	1,222
Franklin	1,811	9,037	880	2,665
Fulton	634	3,232	363	1,166
Gallia	293	1,515	298	640
Geauga	137	976	279	1,029
Greene	7,502	40,900	672	2,110
Guernsey	199	1,017	5,040	7,947
Hamilton.....	702	3,313	105	377
Hancock.....	5,892	30,980	716	2,267
Hardin	2,912	13,867	695	1,659
Harrison.....	104	665	2,031	4,045
Henry	839	4,055	138	428
Highland	3,550	21,837	509	1,539
Hocking.....	269	1,226	1,357	2,897
Holmes	261	670	788	2,035
Huron	278	1,593	688	1,674
Jackson	130	606	344	661
Jefferson.....	142	998	1,894	3,702
Knox.....	541	2,185	1,394	2,951
Lake	50	428	382	942
Lawrence	277	1,282	133	334
Licking	908	5,242	5,644	10,561
Logan	1,463	7,974	824	1,864
Lorain.....	179	1,138	342	1,025
Lucas	467	2,466	90	433
Madison	4,489	21,079	672	1,540
Mahoning	255	1,625	560	1,770
Marion	974	4,483	1,105	2,597
Medina	134	1,248	357	1,154
Meigs	128	905	1,760	2,879
Mercer	7,643	36,048	148	493
Miami.....	733	4,612	246	699
Monroe	291	1,794	2,149	4,106
Montgomery	2,391	13,662	146	530

DOMESTIC ANIMALS DIED FROM DISEASES—Continued.

Counties.	Hogs.		Sheep.	
	Number.	Value.	Number.	Value.
Morgan	196	\$1,305	3,505	\$6,023
Morrow	282	1,928	1,293	2,947
Muskingum	325	1,744	2,807	5,019
Noble	229	1,431	2,090	3,652
Ottawa	2,090	8,992	147	319
Paulding	1,300	6,306	155	333
Perry	142	773	1,196	2,272
Pickaway	7,725	38,221	225	621
Pike	369	1,511	182	389
Portage	244	1,448	474	1,640
Preble	10,236	51,710	193	825
Putnam	4,071	20,615	322	839
Richland	525	2,928	804	2,085
Ross	6,205	27,327	405	1,924
Sandusky	1,714	8,680	399	1,064
Scioto	433	2,027	138	302
Seneca	2,960	13,676	677	1,681
Shelby	3,154	17,172	200	561
Stark	475	2,875	675	1,941
Summit	247	1,438	232	846
Trumbull	360	1,928	713	2,249
Tuscarawas	526	3,067	1,337	3,746
Union	609	2,789	1,304	3,167
Van Wert	4,306	18,828	247	522
Vinton	153	891	901	1,437
Warren	1,902	10,085	282	903
Washington	284	2,018	2,982	5,697
Wayne	714	4,058	717	2,287
Williams	378	1,957	525	1,585
Wood	3,630	16,821	528	1,969
Wyandot	625	3,234	681	1,707
Totals	139,507	\$781,504	76,553	\$178,873

DOMESTIC ANIMALS DIED FROM DISEASES—Continued.

Counties.	Cattle.		Horses.	
	Number.	Value.	Number.	Value.
Adams	222	\$3,925	153	\$8,700
Allen	124	2,508	74	6,115
Ashland	223	3,137	118	12,027
Ashtabula	201	4,862	122	19,695
Athens	226	3,012	95	5,460
Auglaize	272	4,229	165	12,811
Belmont	240	5,015	171	12,653
Brown	183	3,425	148	9,837
Butler	306	6,455	280	22,857
Carroll	152	3,427	92	7,470
Champaign	179	4,492	257	16,195
Clarke	336	3,618	118	15,773
Clermont	158	3,028	197	12,235
Clinton	201	4,838	172	11,910
Columbiana	185	4,465	128	9,538
Coshocton	182	3,334	134	8,735
Crawford	144	2,551	101	8,138
Cuyahoga	227	6,559	170	11,657
Darke	391	6,922	311	24,175
Defiance	198	3,324	145	8,700
Delaware	139	3,661	188	17,539
Erie	224	3,697	144	10,580
Fairfield	329	4,471	162	11,566
Fayette	163	3,596	173	12,696
Franklin	333	7,827	307	25,103
Fulton	164	4,409	132	11,263
Gallia	256	3,558	153	9,725
Geauga	169	4,253	71	5,316
Greene	261	6,182	263	28,240
Guernsey	194	3,878	145	10,739
Hamilton	485	3,885	169	9,465
Hancock	346	7,145	181	16,420
Hardin	193	3,317	163	14,914
Harrison	109	2,699	102	8,090
Henry	170	3,282	168	13,610
Highland	208	3,923	210	12,205
Hocking	141	2,336	139	5,916
Holmes	206	2,902	103	9,665
Huron	167	4,166	213	9,830
Jackson	152	2,256	102	6,545
Jefferson	141	2,958	105	9,155
Knox	122	3,104	101	9,410
Lake	32	1,055	46	3,195
Lawrence	175	2,434	93	4,480
Licking	278	6,861	213	15,336
Logan	210	3,996	201	16,319
Lorain	199	4,804	126	9,520
Lucas	104	2,662	137	10,109
Madison	192	5,146	236	22,945
Mahoning	170	4,083	118	9,924
Marion	195	3,889	208	17,383
Medina	110	3,053	85	7,909
Meigs	199	2,071	83	5,085
Mercer	273	4,590	166	14,280
Miami	230	4,626	231	16,860
Monroe	278	3,898	147	8,742

DOMESTIC ANIMALS DIED FROM DISEASES—Concluded.

Counties.	Cattle.		Horses.	
	Number.	Value.	Number.	Value.
Montgomery	368	\$7,937	317	\$24,161
Morgan	227	3,832	119	8,055
Morrow	126	2,637	143	12,785
Muskingum	544	5,031	190	11,863
Noble	203	3,286	137	9,194
Ottawa	161	2,741	110	8,356
Paulding	235	3,760	165	11,212
Perry	87	1,583	84	5,796
Pickaway	203	5,102	276	23,305
Pike	112	2,202	117	7,550
Portage	232	6,273	148	10,755
Preble	227	4,782	204	15,502
Putnam	345	5,920	169	14,824
Richland	190	4,048	151	14,395
Ross	259	5,217	274	19,482
Sandusky	236	5,163	178	16,115
Scioto	192	3,087	132	7,336
Seneca	202	4,263	209	20,060
Shelby	257	6,944	163	14,330
Stark	371	6,461	282	19,625
Summit	212	4,856	108	8,975
Trumbull	253	6,543	146	10,127
Tuscarawas	369	4,898	153	12,685
Union	102	2,376	159	14,590
Van Wert	204	3,278	185	15,497
Vinton	157	2,356	92	4,344
Warren	245	5,039	199	13,522
Washington	288	4,617	156	9,838
Wayne	339	6,310	239	29,617
Williams	146	3,615	148	12,510
Wood	288	6,039	218	18,802
Wyandot	98	2,296	132	9,950
Totals	19,115	\$367,623	14,238	\$1,109,966

LOSSES BY FLOODS—BONDS, ETC., EXEMPT FROM TAXATION.

Counties.	Live stock— value.	Grain— value.	Houses— value.	Fences— value.	Bonds, etc., ex- empt from taxation.
Adams.....	\$153	\$325			\$152,265
Allen.....		200			2,600
Ashland.....	100			\$20	1,920
Ashtabula.....					22,800
Athens.....		20,495		10	39,906
Auglaize.....					
Belmont.....	4	874	\$500	331	87,900
Brown.....					40,662
Butler.....					1,525
Carroll.....					2,192
Champaign.....					
Clarke.....					17,050
Clermont.....					62,975
Clinton.....					3,035
Columbiana.....					41,765
Coshocton.....		2,880		240	27,433
Crawford.....					2,903
Cuyahoga.....		20	125	5	83,300
Darke.....	5	50			4,130
Defiance.....		366		50	
Delaware.....		35			15,920
Erie.....					1,000
airfield.....	12	1,285		30	4,900
Fayette.....					
Franklin.....	16	276		82	15,855
Fulton.....					
Gallia.....					9,682
Geauga.....					2,400
Greene.....					4,050
Guernsey.....		1,080			13,300
Hamilton.....					143,295
Hancock.....					3,655
Hardin.....		6,150			2,300
Harrison.....		1,715		95	24,800
Henry.....					
Highland.....		25		30	284,843
Hocking.....		13,145	20	100	15,280
Holmes.....					1,045
Huron.....		85		10	22,350
Jackson.....			1,480		16,004
Jefferson.....		1,150			7,274
Knox.....					14,395
Lake.....					14,600
Lawrence.....					47,680
Licking.....		1,290		370	7,316
Logan.....					141,599
Lorain.....				20	14,300
Lucas.....					
Madison.....					900
Mahoning.....				104	45,300
Marion.....					31,480
Medina.....					
Meigs.....		3,735		30	4,605
Mercer.....					7,980
Miami.....					
Monroe.....		1,367		710	13,187

LOSSES BY FLOODS—BONDS, ETC.—Concluded.

Counties.	Live stock— value.	Grain— value.	Houses— value.	Fences— value.	Bonds, etc., ex- empt from taxation.
Montgomery.....		\$40			\$8,955
Morgan.....		295			24,505
Morrow.....				\$375	
Muskingum.....		1,185		20	64,460
Noble.....		680			5,095
Ottawa.....					300
Paulding.....		5,584		216	2,961
Perry.....	40	100		20	65,852
Pickaway.....		2,005		270	5,705
Pike.....		1,555			2,000
Portage.....					95,962
Preble.....		45			7,725
Putnam.....					5,000
Richland.....					4,900
Ross.....		625			
Sandusky.....					3,500
Scioto.....		3,100		160	10,195
Seneca.....					
Shelby.....					3,500
Stark.....					6,020
Summit.....					30,372
Trumbull.....		952		45	257,825
Tuscarawas.....		3,667		585	17,330
Union.....		50			
Van Wert.....		8,485			
Vinton.....		9,755		282	650
Warren.....				25	46,210
Washington.....		21,512	\$75	643	99,865
Wayne.....					250
Williams.....					
Wood.....					12,622
Wyandot.....		435			4,600
Totals.....	\$290	\$116,648	\$2,200	\$4,878	\$2,312,015

TABULAR STATEMENT

EXHIBITING THE NUMBER OF HORSES, CATTLE, MULES, ETC., SHEEP AND HOGS RETURNED TO THE AUDITOR OF STATE'S OFFICE BY THE SEVERAL COUNTY AUDITORS, FOR THE YEARS 1888 AND 1889.

Counties.	Number of horses.		Number of cattle.		Number of mules.		Number of sheep.		Number of hogs.	
	1888.	1889.	1888.	1889.	1888.	1889.	1888.	1889.	1888.	1889.
Adams.....	5,586	5,881	13,944	13,341	251	255	12,668	12,133	14,140	13,116
Allen.....	8,882	9,388	16,460	20,021	226	230	24,637	22,439	21,840	25,161
Ashland.....	8,583	8,926	18,254	17,425	116	112	47,842	48,828	17,462	19,638
Ashtabula.....	10,989	11,828	31,393	29,804	47	43	22,577	24,730	5,127	6,034
Athens.....	5,136	5,303	13,703	12,674	332	325	80,822	74,368	5,342	4,878
Auglaize.....	8,251	8,772	17,607	16,841	334	352	13,174	12,267	21,158	23,138
Belmont.....	10,205	10,308	22,608	22,493	376	375	132,183	115,365	17,803	16,118
Brown.....	7,927	8,458	16,331	15,077	324	326	11,388	8,786	25,982	20,765
Butler.....	11,042	11,268	20,233	18,141	988	1,011	6,737	6,411	23,824	23,545
Carroll.....	5,641	5,956	14,043	13,778	140	102	113,284	105,000	9,559	9,859
Champaign.....	11,255	11,557	19,262	18,337	189	201	26,559	23,428	27,490	27,998
Clarke.....	10,510	11,220	18,782	16,807	338	321	42,246	47,567	22,122	25,545
Clermont.....	8,464	8,814	14,196	13,548	847	942	5,632	5,099	20,709	17,686
Clinton.....	10,187	10,834	18,027	16,873	376	364	25,044	23,991	40,688	32,382
Columbiana.....	10,627	10,986	20,903	19,712	205	202	83,693	76,097	13,846	14,397
Coshocton.....	7,086	7,563	17,385	17,527	215	214	117,309	110,019	16,212	17,500
Crawford.....	8,792	8,975	17,688	17,784	147	147	46,691	47,024	25,667	28,625
Cuyahoga.....	20,035	18,005	20,029	18,022	344	334	11,313	11,323	3,317	4,201
Darke.....	14,695	15,179	29,206	27,014	548	589	5,475	5,459	39,997	35,178
Defiance.....	6,548	6,865	14,233	13,642	156	158	8,258	14,836	12,803	17,097
Delaware.....	9,885	10,320	17,393	17,547	131	123	81,150	88,986	19,894	21,775
Erie.....	5,596	5,884	8,403	8,233	36	33	22,326	23,312	7,731	7,978
Fairfield.....	10,212	10,420	23,013	21,815	167	162	26,127	24,342	36,763	35,431
Fayette.....	10,010	10,445	18,676	19,018	316	294	20,293	19,810	38,023	33,385
Franklin.....	17,460	17,720	26,146	24,116	389	309	23,804	22,054	30,415	30,415
Fulton.....	7,902	8,348	16,522	17,047	98	96	35,074	32,054	20,409	21,359
Galla.....	6,040	6,190	15,352	14,684	293	277	11,525	12,908	11,043	9,805
Geauga.....	5,512	5,914	18,567	18,588	30	30	17,414	17,961	3,002	4,023

Greene	11,104	11,269	18,028	17,798	280	288	26,730	24,931	31,216	26,543
Guernsey	6,554	7,408	15,816	16,740	208	190	128,914	120,365	10,284	9,446
Hamilton	19,080	19,402	24,183	23,327	2,639	2,682	3,067	2,564	13,207	12,905
Hancock	10,758	11,774	24,154	23,384	197	201	45,016	44,638	34,960	38,209
Hardin	8,662	12,435	18,659	19,058	281	274	51,738	44,604	21,560	23,518
Harrison	6,751	6,926	14,075	13,173	81	79	158,247	150,306	8,876	8,605
Henry	6,708	7,620	14,817	14,370	199	184	11,184	10,509	19,959	24,070
Highland	10,185	10,605	21,292	21,752	322	288	18,710	16,637	36,310	30,990
Hocking	3,682	4,006	9,695	11,174	136	144	37,670	32,893	6,992	7,062
Holmes	7,151	7,813	16,487	16,755	178	189	89,395	39,253	19,160	21,085
Huron	9,310	9,238	18,590	17,601	120	104	62,254	65,199	12,858	15,254
Jackson	3,791	4,097	18,781	14,063	661	691	11,902	11,339	6,744	6,454
Jefferson	6,835	7,043	15,124	13,406	220	232	98,098	91,918	9,291	8,605
Knox	9,753	10,388	18,103	18,346	148	141	125,994	117,197	19,259	21,791
Lake	4,381	4,424	7,999	8,002	48	45	16,813	16,813	1,615	1,962
Lawrence	4,067	4,255	12,615	12,507	784	741	4,493	3,822	8,015	7,256
Licking	12,915	13,893	26,641	27,293	168	209	174,672	167,320	25,687	27,091
Logan	10,085	10,457	19,842	18,781	225	197	54,268	50,406	24,837	24,862
Lorain	10,659	11,042	27,220	25,433	81	31	28,897	30,761	8,925	10,329
Lucas	8,263	8,511	10,193	10,202	148	205	5,620	5,768	8,835	9,863
Madison	9,287	9,718	22,138	22,598	235	302	59,604	63,333	40,327	33,316
Mahoning	9,287	9,589	17,750	16,939	167	191	43,524	41,300	7,887	8,885
Marion	8,343	8,922	15,668	15,529	226	234	64,233	67,663	22,328	25,302
Medina	9,574	9,944	19,845	18,720	77	76	47,302	49,185	8,807	9,540
Meigs	5,149	5,404	12,959	12,729	394	412	45,567	43,443	6,517	5,991
Mercer	8,925	9,500	21,698	20,697	260	242	9,185	8,517	28,268	27,755
Miami	11,534	11,721	17,383	16,096	407	373	7,725	5,555	17,519	16,217
Monroe	6,114	6,740	18,561	18,070	176	170	42,711	37,514	11,011	9,681
Montgomery	15,411	16,392	22,295	20,853	411	397	4,064	3,653	25,002	22,443
Morgan	6,385	6,686	14,653	15,508	125	118	100,161	94,726	8,728	8,475
Morrow	8,343	8,510	14,141	13,686	95	82	89,396	88,999	12,321	14,053
Mucklingum	11,190	11,503	26,199	25,862	371	350	135,079	129,469	15,467	15,155
Noble	5,863	6,148	16,988	16,866	95	99	84,815	75,681	11,537	10,802
Ottawa	5,492	5,513	9,915	10,614	36	40	11,997	11,345	10,306	11,257
Paulding	5,199	5,643	11,226	10,100	181	196	7,412	7,050	9,409	9,705
Perry	5,808	5,915	14,669	14,499	194	167	47,642	53,086	9,268	9,376
Pickaway	10,954	11,440	21,326	22,934	350	411	13,092	11,361	33,386	30,107
Pike	4,291	4,431	8,760	8,762	361	408	7,046	5,476	9,473	8,452
Portage	9,660	9,798	24,062	23,101	64	76	34,242	35,328	68,52	7,862
Preble	9,832	9,994	17,441	17,749	236	319	7,441	7,019	30,445	23,618

TABULAR STATEMENT EXHIBITING THE NUMBER OF HORSES, CATTLE, MULES, ETC.—Concluded.

Counties.	Number of horses.		Number of cattle.		Number of mules.		Number of sheep.		Number of hogs.	
	1888.	1889.	1888.	1889.	1888.	1889.	1888.	1889.	1888.	1889.
Putnam	8,884	9,488	20,611	18,652	274	244	12,274	10,570	20,423	31,160
Richland	10,707	11,154	19,971	19,174	310	308	54,125	54,912	21,468	23,451
Ross	11,844	12,167	22,376	23,930	351	344	14,086	14,086	33,023	30,213
Sandusky	8,272	9,037	17,027	16,671	160	158	26,115	25,848	25,725	29,716
Scioto	4,473	4,847	12,899	12,249	923	936	3,591	2,805	9,210	8,085
Seneca	10,767	11,348	20,244	20,655	158	166	49,407	50,016	31,959	35,414
Shelby	8,707	9,187	18,712	17,085	163	156	8,326	6,917	23,178	21,398
Stark	14,568	14,549	29,928	28,305	370	381	39,899	38,978	24,657	26,258
Summit	10,434	10,512	22,157	21,245	113	122	18,050	19,172	10,788	11,495
Trumbull	12,065	12,418	31,677	30,834	122	88	42,388	44,600	7,013	7,932
Tuscarawas	9,235	9,937	24,840	24,429	200	188	71,466	64,086	17,174	17,701
Union	9,083	10,034	15,051	15,900	112	106	63,146	61,719	25,864	27,240
Van Wert	8,136	8,933	17,512	16,336	319	310	12,802	11,900	22,751	24,317
Vinton	2,853	2,994	8,586	8,758	232	235	35,315	31,273	3,718	3,808
Warren	9,664	10,254	16,055	15,009	590	588	12,294	10,813	28,358	23,453
Washington	8,177	8,245	20,826	19,086	263	258	79,761	65,057	11,589	10,588
Wayne	12,134	12,257	28,527	26,122	236	214	30,042	29,684	25,700	27,252
Williams	7,511	8,301	15,414	15,981	153	147	29,267	31,654	22,800	24,855
Wood	10,382	1,089	21,777	21,213	273	266	27,904	23,928	31,705	32,091
Wyandot	7,780	8,528	14,846	15,405	172	165	74,047	79,178	24,036	27,279
Totals	786,549	785,703	1,612,726	1,572,524	25,180	24,120	3,730,440	3,805,079	1,029,616	1,611,921

OFFICE OF THE AUDITOR OF STATE,
COLUMBUS, OHIO, August 1, 1889.

I hereby certify, the foregoing to be a true copy, taken from the reports of the several county auditors, as returned to this office.
Witness my hand and seal officially.

E. W. Poe, Auditor of State.

COMPARATIVE TABLE, EXHIBITING THE NUMBER OF BUSHELS OF WHEAT AND CORN PRODUCED ANNUALLY, FROM 1850 TO 1888, INCLUSIVE.

Year.	Busbels of wheat.	Average number of bushels to acre.	Busbels of corn.	Average number of bushels to acre.
1850.....	31,500,000	18.	56,619,608	36.8
1851.....	25,309,225	15.2	61,171,282	36.7
1852.....	23,043,737	14.1	58,165,517	33.6
1853.....	17,118,811	12.	73,436,970	40.
1854.....	11,989,110	8.	52,171,551	26.
1855.....	19,569,320	13.61	87,587,434	39.7
1856.....	15,338,837	10.2	57,802,515	27.7
1857.....	25,397,614	14.	82,555,186	36.6
1858.....	17,656,483	10.4	50,863,582	27.7
1859.....	13,317,967	7.2	68,730,846	29.5
1860.....	23,640,356	13.8	91,588,704	33.2
1861.....	20,055,424	11.	74,858,878	33.5
1862.....	20,764,887	12.	62,704,887	30.
1863.....	20,452,410	11.36	54,614,617	27.
1864.....	15,541,385	9.33	54,053,491	27.
1865.....	18,284,189	9.	68,053,668	35.
1866.....	5,924,747	4.50	80,386,320	36.5
1867.....	13,350,726	11.51	63,875,064	29.8
1868.....	16,480,059	11.31	76,725,288	34.4
1869.....	26,499,729	15.37	62,443,346	28.4
1870.....	18,726,341	11.29	88,565,299	37.5
1871.....	22,274,378	13.27	98,363,060	36.7
1872.....	18,987,664	11.22	103,053,234	40.9
1873.....	21,974,385	12.61	84,049,328	35.1
1874.....	26,896,818	14.51	101,815,494	39.8
1875.....	17,867,967	9.22	97,825,024	34.1
1876.....	15,354,569	10.18	112,552,642	36.8
1877.....	27,306,566	15.63	101,884,305	32.5
1878.....	35,218,783	16.58	114,839,127	37.8
1879.....	41,062,120	17.78	96,908,800	34.
1880.....	48,540,307	17.20	105,414,594	38.9
1881.....	33,102,633	13.90	78,712,796	31.
1882.....	42,112,408	15.59	90,869,137	34.
1883.....	27,169,738	10.67	64,001,618	24.2
1884.....	36,396,119	14.4	87,797,813	33.3
1885.....	24,183,430	9.8	112,192,744	39.0
1886.....	37,661,681	14.	88,818,556	33.5
1887 (October estimate).....	28,400,000	10.4	83,118,838	30.5
1888.....	26,160,994	11.7	111,155,506	38.9

WHEAT AVERAGE.

Average per acre of first term of nine years.....12.86; average total.....20,754,000 bushels.
 Average per acre of second term of nine years..... 9.86; average total.....17,245,000 bushels.
 Average per acre of third term of nine years.....12.11; average total.....20,462,000 bushels.
 Average per acre of the term of twenty-seven y'rs.....11.61; average total.....19,487,000 bushels.
 Average per acre of last seven years, up to 1882.....16.14; average total.....29,638,000 bushels.
 Average per acre of last seven years, up to 1889.....13.1 : average total.....32,064,797.

CORN AVERAGE.

Average per acre first term of nine years.....37.1; average total.....64,474,860.
 Average per acre of second term of nine years.....31.7; average total.....68,762,942.
 Average per acre of third term of nine years.....35.4; average total.....91,710,302.
 Average per acre for last ten years, up to 1837.....33.8; average total.....94,151,349.

R E P O R T

OF THE

O H I O

Centennial Board of Directors.

Report of the Board of Directors.

By a Joint Resolution of the 67th General Assembly, adopted March 12th 1886, the Board of Directors of the Ohio Centennial Exposition (whose office was created and duties defined by said resolution), was required to make a final and full report of its work and proceedings, to the General Assembly, when that work was completed. Such a report is herein presented.

The city of Marietta claiming rightfully the honor of being the first permanent settlement in the territory that now forms the State of Ohio, had planned, through her organized citizenship, the celebration of the 7th of April, 1888, as the Centennial Anniversary of that first landing and settlement, which was the beginning of civilization in the great Northwest. This proposed historical and social celebration at Marietta, while most appropriate and befitting in itself, and of deep interest to every patriotic citizen of the State, seemed, nevertheless, in the minds of many of those citizens, a local, rather than a State celebration, and as such, an inadequate recognition of the Centennial, of an event of such vast significance, and one which had borne such wonderful fruits. Such conquests over nature, such development of the material resources of the country, such growth in population, such march of empire, such advancement and enrichment of civilization, had made this hundred years of history more thrilling than any romance. And the celebration of the completion of this first century since the planting of civilization here, seemed an event in which the citizenship of the whole commonwealth should be interested participants. And thereupon it was suggested that Ohio as a *State* should celebrate in a larger way, the event which Marietta was to celebrate so appropriately as a *city*. Consultations were held among the leaders of several State Societies, and finally this idea of a *State* celebration, chrystalized into the following action :

[House Joint Resolution No. 8].

JOINT RESOLUTION

To provide for the holding of a Centennial Exposition at the capital of the State, in September, 1888, demonstrating the material and educational progress and growth of the State during its first century.

WHEREAS, The year 1888 marks the end of a century since the first permanent settlement was made in the State of Ohio; and

WHEREAS, This century has been one of greatest progress in the history of civilization—a progress in which Ohio has taken a leading part; and

WHEREAS, It is not only practicable, but desirable, that the people of Ohio should commemorate in some appropriate manner the close of the first century of our history, and the beginning of the second; therefore,

Be it resolved by the General Assembly of the State of Ohio, That the one hundredth anniversary of the first settlement of the State, now among the foremost in rank and importance in the Union, be celebrated during the month of September, in the year 1888, by the holding, at the capital of the State, of an Exposition demonstrating the material and educational progress and growth of the State, during its first century. Said Exposition to be held on the grounds of the State, used and controlled by the Ohio State Board of Agriculture for State Fair purposes. For the purpose of carrying out the intent of this resolution, there is hereby created a Board of Directors, consisting of nine members, five of whom shall be appointed by the Ohio State Board of Agriculture, two by the State Archaeological and Historical Society, and one by the Horticultural Society, with the Governor of the State a member and presiding officer of the Board. The Board of Directors shall have the control of all business connected with the preparation and holding of the Centennial Exposition, and shall establish rules and regulations for the government of the various departments connected therewith, making such rules and extending such encouragement with respect to exhibitors, as shall secure intelligent representation in the departments of education, history, art, science, agriculture, horticulture, live stock, forestry, mechanics, mining, commerce, transportation, merchandise, journalism, domestic manufactures, and all the arts and industries beneficial to mankind. The Board of Directors shall define the various departments of said exposition, and appoint commissioners in charge of the different departments, who shall conduct the affairs of their respective departments according to the regulations adopted by said Board, and report from time to time to the Board. The Board of Directors shall report to the General Assembly in 1887, the progress made toward carrying out the provisions of this resolution, and in 1888 shall make a full and complete report of the Exposition. [The resolution, upon its passage by both branches of the General Assembly, was properly signed by]

DANIEL J. RYAN,

Speaker pro tem. of the House of Representatives.

ROBERT P. KENNEDY,

President of the Senate.

In accordance with the plan outlined in this resolution, the following selection of members of the Board of Centennial Directors was made:

By the State Board of Agriculture:

L. B. HARRIS, of Wyandot County,
W. S. FOSTER, of Champaign County,
C. D. BAILEY, of Gallia County,
J. C. LEVERING, of Knox County,
HENRY TALCOTT, of Ashtabula County.

The State Historical Society appointed:

GEN. R. BRINKERHOFF, of Richland County, and
H. T. CHITTENDEN, of Franklin County.

The State Horticultural Society named:

GEN. S. H. HURST, of Ross County.

Governor J. B. FORAKER was by the resolution *ex officio* a member, and President of the Board.

On the 5th day of May, 1886, this Board met at the rooms of the State Board of Agriculture, and organized by electing H. T. Chittenden, Vice-Chairman, L. B. Harris, Treasurer, and A. A. Graham, Temporary Secretary.

A plan for organizing and conducting the Exposition was matured by the Board, and in January, 1887, was completed and submitted to the General Assembly in our report of the progress of the Centennial work. As a part of the history of that work this plan is here briefly outlined:

PLAN OF THE OHIO CENTENNIAL EXPOSITION.

ORGANIZATION.

For the efficient conduct and management of the Exposition the Board of Directors shall appoint one Director-General, one Commissioner over each Department, a Secretary, a Treasurer, and a Manager of Transportation.

These officers shall have the active management of the details of the Exposition; their headquarters shall be at the office of the Board, in the city of Columbus, Ohio, and their duties, powers and compensation shall be fixed by said Board of Directors.

DIRECTOR-GENERAL.

The Director-General shall exercise such supervision, direction and control of the organization and conduct of the Exposition as will tend to promote the success of every department therein. It shall be his duty to avail himself of the judgment of the Board of Directors, and be governed by its instructions, but in the absence of instructions from the Board he shall be authorized to exercise all necessary executive powers. He shall, with the Commissioners, determine the scope and limitation of the departments, the space they shall severally occupy, the duties and powers of the superintendents and assistants, and shall formulate all rules and regulations pertaining thereto.

COMMISSIONERS.

For the proper organization and management of the several departments of the Exposition, there shall be over each, one Commissioner, who shall be appointed by the Board, on consultation with the Director-General, and who shall be known as Commissioner of ——— Department. These commissioners shall have charge of the details of their respective departments, subject to the supervision and direction of the Director-General. They shall appoint, with the approval of the Board, such superintendents of divisions and assistants as the work of the various departments may, from time to time, in the opinion of the Board, require.

THE SECRETARY.

The Secretary shall have charge of the correspondence, office-work, books and records of the Board, and perform such other duties as may appertain to this department. He shall prepare for publication, notices of general information, circulars, advertisements, etc., and shall assist in awakening popular interest in the Exposition in such ways as the Board shall advise. He shall also act as Secretary of the Director-General, and the Commissioners, when acting as a body.

REPORT OF BOARD OF

THE TREASURER.

The Treasurer shall have charge of the finances of the Exposition; of matters relating to tickets, entrances, exits, gates and gate-keepers; and of the proceeds of all privileges. He shall be required to give bond, with approved securities, in the sum of not less than one hundred thousand dollars.

THE MANAGER OF TRANSPORTATION.

The Manager of Transportation shall have charge of all matters relating to freight and passenger traffic, excursion and special trains, and of advertising of the same.

COUNTY CENTENNIAL COMMISSIONERS.

The Director-General shall appoint, with the approval of the Board of Directors, in each county in Ohio, three commissioners, to be known as the "—— County Centennial Commissioners," they shall organize, under the direction of the Director-General, local societies, for the purpose of awakening and stimulating an interest in the Exposition. They shall arrange for Centennial lectures in their several localities, and shall, through the public schools, farmers' institutes, and other organizations, assist to promote the success of the Exposition.

DEPARTMENTS.

For the proper management of the business of the Exposition, and for the necessary systemization of the exhibits, the Exposition shall be divided into sixteen departments, as follows:

1. Department of History and Archæology.
2. Department of Science and Education.
3. Department of Fine Arts.
4. Department of Agriculture.
5. Department of Horticulture.
6. Department of Floriculture and Forestry.
7. Department of Live Stock.
8. Department of Mining and Metallurgy.
9. Department of Mechanics and Machinery.
10. Department of Manufactures.
11. Department of Merchandise.
12. Department of Commerce and Transportation.
13. Department of Printing and Journalism.
14. Department of Woman's Work.
15. Department of Public Service and Charities.
16. Department of Entertainments.

1. DEPARTMENT OF HISTORY AND ARCHEOLOGY.

The Department of History and Archæology shall include collections of historical manuscripts, letters, circulars, pamphlets, papers, books, pictures, photographs, paintingé, busts, etc., costumes, currency and pioneer money of all kinds, pioneer relics, and all objects and articles illustrative of the history of Ohio and the Northwest. Also all collections of the relics of Mound-Builders, including casts and models of the pre-historic remains of Ohio; collections of Indian relics, war relics, and all articles illustrative of the history of Ohio.

2. DEPARTMENT OF SCIENCE AND EDUCATION.

The Department of Science and Education shall include text-books (old and new), school apparatus, furniture, etc., and work in kindergartens, industrial schools, public schools, normal schools, colleges and universities, Sunday-school work, and also the work of the weather and Signal Service Bureaus, telegraph, telephone, and all electrical apparatus; philosophical and scientific instruments; music and musical instruments.

A chemical laboratory will also be operated in this department.

3. DEPARTMENT OF FINE ARTS.

The Department of Fine Arts shall include engravings of all kinds, etchings, crayon work, modeling, moulding and sculpture in clay, plaster, marble and bronze; carving in wood and metal; photography, photo-lithography; copies of standard works by brush, pen, pencil or chisel; architectural designs and drawings; painting on canvas, satin, velvet, silk, china, porcelain, glass, etc.; wood paneling and decorative work of all kinds.

4. DEPARTMENT OF AGRICULTURE.

The Department of Agriculture shall include exhibits of all cereal products, grass sugar-cane, honey, sorghum and maple products, all vegetables, flax, fertilizers, tobacco, all dairy products and all garden products.

5. DEPARTMENT OF HORTICULTURE.

The Department of Horticulture shall include exhibits of fruits of all varieties, nuts, berries, and canned fruits, preserved fruits, candied fruits, dried fruits, pickled fruits and fruit jellies.

6. DEPARTMENT OF FLORICULTURE AND FORESTRY.

The Department of Floriculture and Forestry shall include all exhibits in flowers, hardy and green-house shrubs; ferns, mosses and palms; cut flowers, floral designs, ornamental vines, variegated leaved plants and ornamental shade-trees; also, native woods for timber, lumber, finishing pulp, roots, sap and bark.

7. DEPARTMENT OF LIVE STOCK.

The Department of Live Stock shall include all exhibits of horses, cattle, sheep swine, poultry, fish and birds, and all exhibits of draft and speed animals, and all trials and tests in the speed ring.

8. DEPARTMENT OF MINING AND METALLURGY.

The Department of Mining and Metallurgy shall include all exhibits of the mines of coal, iron, stone, salt, clay, sand, lime, slate, crude glass, petroleum and all crude minerals and ores.

9. DEPARTMENT OF MECHANICS AND MACHINERY.

The Department of Mechanics and Machinery shall include all exhibits of Machinery and appliances used for forging, crushing, smelting, lifting, excavating, grinding, pumping, pressing, spinning, weaving, sawing, planing, mortising, drilling, plowing, harrowing, cutting, raking, bending, threshing, ditching, and exhibits in all machinery used in converting crude materials into useful articles.

10. DEPARTMENT OF MANUFACTURES.

The Department of Manufactures shall include exhibits in domestic manufactures, furniture, stoves, ranges and heaters; all exhibits of carriages, pleasure vehicles, velocipedes, bicycles and tricycles.

11. DEPARTMENT OF MERCHANDISE.

The Department of Merchandise shall include all exhibits of fine textile fabrics, clothing, boots and shoes, hats and caps, curtains, carpets, wall paper, upholstery, crockery and all domestic utensils; jewelry, silver-ware, hand-ware, dry goods, millinery, drugs, regalia, groceries, canned goods, confectionery, etc.

12. DEPARTMENT OF COMMERCE AND TRANSPORTATION.

The Department of Commerce and Transportation shall include all articles demonstrating the progress made in the growth of industry, viz.: Exhibits of the stage-coach and its methods of use in primitive days, the canal boat, river boats, canoes, pinogues, etc; the steam-boat and methods of propulsion by steam and electricity; railways and railway cars, street cars, omnibuses, cable roads and all appliances illustrating the transportation of freight and passengers.

13. DEPARTMENT OF PRINTING AND JOURNALISM.

The Department of Printing and Journalism shall include all exhibits of newspapers (old and new). Printing of circulars, pamphlets, magazines, books, etc. Plain and ornamental job work; exhibits of printing presses, type, type-making machinery, electrotyping, stereotyping, engraving on wood blocks and on chalk, and zinc and copper etching, book-binding and book-binding machinery.

14. DEPARTMENT OF WOMAN'S WORK.

The Department of Woman's Work shall include all exhibits of woman's work in art, pottery, decorations, needle-work, ornamental work, domestic and household work, and of everything that may properly be denominated "Woman's Work." The Commissioner in charge of this department shall be a woman.

15. DEPARTMENT OF PUBLIC SERVICES AND CHARITIES.

The Department of Public Services and Charities shall exhibit the provision made for the care, education and training of the deaf and dumb, blind, feeble-minded youth, insane, indigent, infirm and afflicted, including poor children, with the progress made in their care, treatment and education in county infirmaries, poor-houses, jails, penitentiaries, and in State, district and county homes, in reformatory institutions and in the State asylums. Classes from the asylums for the Deaf and Dumb, Blind, Feeble-Minded Youth, and from the Boys' and Girls' Industrial Homes, will be conducted, by their proper teachers, at the pavilion of this department.

16. DEPARTMENT OF ENTERTAINMENT AND CEREMONIES.

To the Department of Entertainment shall be assigned all matters relating to the ceremonies of opening, closing and special days; all athletic contests, competitive drills for military, Grand Army, Knights of Pythias, Odd Fellows, etc., and public exhibitions of all kinds; all assignments of public days for municipalities, military organizations, secret societies, etc.

CHARACTER OF EXHIBITS.

In each department the exhibits must be, in all cases, the best and most representative of their kind. Each department shall, in itself, demonstrate the progress made therein during the century. Primitive machinery, appliances, implements of industry, and methods of the pioneers, shall, as far as practicable, be shown in connection with the advance, growth and improvements made during the century. The present condition of arts, science, education and industries shall be fully shown.

SPECIAL COLLECTIONS.

Special collections of Ohio woods, grasses, cereals, fruits, ores and metals, stuffed animals and birds, insects and fishes, shall be made. Also special collections shall be made exhibiting Ohio history and biography, by sketches, photographs, paintings, busts, models, etc.

PERISHABLE EXHIBITS.

All exhibits of perishable articles—flowers, fruits, etc.—shall be renewed as often as necessary.

LIMITATION OF EXHIBITS.

The Exposition will be largely made up of Ohio products, but in many departments exhibits from our sister States will be admitted, so as to show more fully the wonderful and varied wealth of the country.

CHARACTER OF DISPLAYS.

All structures, displays and exhibits shall be neat and attractive in form, and approved by the Board. Unsightly and uncleanly articles, exhibits and structures, will not be admitted.

PREMIUMS AND MEDALS.

Premiums, medals and diplomas shall be offered to exhibitors or contestants, in the various departments, in such amounts and forms as the Board may determine.

OPENING AND CLOSING DATES.

The Exposition shall open Tuesday, September 4, 1888, and continue open forty days, Sundays excluded. The Exposition grounds will be open ninety days before the commencement of the Exposition, for the admission and arrangement of exhibits. The Commissioners will be present, in charge of their respective departments, and attend to the placing of all exhibits. All exhibits must be in position, and ready for the inspection of the public, on opening day. Any violation of this rule will subject the exhibitor to such fines and penalties as the Board may determine.

ARTICLES FOR SALE.

All articles entered for exhibition and intended for sale, shall be so indicated; but no such article sold shall be removed till the close of the Exposition, except by consent of the Commissioner of the Department.

This outlined plan also contemplated the giving of special prominence and imposing interest to the ceremonies of the opening days of the

Exposition, the bringing together the officers of State and of the General Assembly, the representatives of our sister States of the Northwest, and the mother States of the East, the authorities of the General Government, and leading men from every field of thought and labor, throughout the State and country. Especially did it look to the reunion as an element of this great celebration of all the sons and daughters of Ohio, who, either at home or abroad, in public or in private life, had honored their State by the development of high qualities or great abilities, in any special field of work, or by eminent utilitarian, scholarly, or artistic attainments.

Special days were also to be assigned for the celebration of patriotic and civic societies, churches, political parties, and educational and industrial organizations, such as might wish to celebrate here their accomplished work in the century just closing. The wide significance of the event to be celebrated, the fact that the first permanent settlement in Ohio was also the first settlement of the vast territory northwest of the Ohio river, out of which five great States had been formed, suggested that this celebration should not be confined within State lines, but should include all the States carved out of the old Northwest Territory, and which, like our own State, had been dedicated forever to freedom by the Ordinance of 1787.

Official authority was therefore sought to invite these States in an appropriate and special manner to join us in the celebration of our Great Centennial Jubilee. The General Assembly therefore passed the following:

JOINT RESOLUTION.

WHEREAS, This General Assembly did, at its last session by joint resolution, passed unanimously, distinctly recognize the great importance of the acquisition and occupation of the "Territory northwest of the river Ohio," and did recommend the celebration of those events, and also did recommend the erection of a suitable memorial structure at Marietta, Ohio, commemorative of the services of the men who laid the foundations of free States within the aforesaid territory; and

WHEREAS, The General Assembly did also recommend an Exposition of the industrial and educational progress of the people of Ohio, to be held in her capital city in the autumn of the year 1888; and

WHEREAS, The four States, Indiana, Illinois, Michigan and Wisconsin, which, with Ohio, comprise the old "Northwest Territory," and, therefore, have in common an historical interest in these events, and in the proposed proceedings commemorative thereof; and

WHEREAS, The General Assembly of the State of Ohio fully recognize the importance and significance of our great organic law, the Ordinance of 1787, and of the first settlement of our soil made in pursuance thereof at Marietta, April 7, 1788, and that the occasion of its Centennial should be made one in which not only the State of Ohio, but the other States forming the "Northwest Territory," can participate; and believing it to be the earnest wish of the people of Ohio, that the five great commonwealths now comprising this territory shall unite in the social celebration of these events at Marietta,

Ohio, in April, 1888, and also in the industrial and educational Exposition at the capital in the autumn of the same year; therefore,

Be it resolved by the General Assembly of the State of Ohio, That a cordial invitation be extended to the people of the heretofore mentioned States, to participate in the efforts now in progress to celebrate these events, and to preserve for the benefit of posterity the memories of those who laid the enduring foundations of republican institutions in the central portion of this great republic.

Resolved 2nd, That the governor is hereby requested to transmit to the executive of each of the States of Indiana, Illinois, Michigan and Wisconsin, copies of this joint resolution, in such manner and with such greetings, and formal invitations as he may deem proper.

JOHN C. ENTREKIN,
Speaker of the House of Representatives.
S. A. CONRAD,
President pro tem. of the Senate.

Therefore, a special messenger was sent by this Board to the Governor of each of the States of Indiana, Illinois, Michigan and Wisconsin, bearing a copy of the above resolutions, and a formal and cordial invitation from the Governor of Ohio, to the people of those States to participate in our Centennial. These invitations were all cordially received and responded to by a most cordial acceptance.

The same considerations of interest in the event to be celebrated made it seem proper that the parent States of Massachusetts, Connecticut and Virginia, from which we had derived our territory, and a large proportion of our pioneer population, should also be invited to join us in celebrating the triumph of our first century. The Governor of Ohio, therefore, at our request, sent similar invitations to the Governors and people of the above named States. These invitations were likewise borne by a special messenger from our Board, and were received and responded to with the deepest cordiality. Thus largely had we planned for this Great Celebration, and seven States joined us to make the occasion alike worthy and historic.

In the month of May, 1887, the organization of the Board was more fully completed by the selection of Gen. S. H. Hurst, of Ross county, as Director General, Mr. L. N. Bonham, of Butler county, as Secretary, and A. A. Graham and Jas. W. Fleming, of Columbus, as Assistant Secretaries.

During the summer of 1887, the work and scope of the several departments were more clearly determined, and commissioners were selected with reference to their special fitness for the work of the department to which they were respectively assigned. But no active work was entered upon until the month of October that year.

Then the Director General and Secretary, with the counsel of the Board, began to map out the work and prepare for the great celebration. Contracts were entered into for furnishing a large supply of lithographic

advertising work, and large numbers of circulars and prospectuses were published and scattered over the State. A hundred Farmers' Institutes were to be held during the winter under the auspices of the State Agricultural Board, and it was determined that the Director General should visit as many of these as possible, and in the form of a lecture present to the people of all sections of the State the interests of our Great Industrial Exposition. That he should distribute extensively our circulars and other literature, advising the people of the purpose, plan and scope of the proposed Centennial Exposition, and, where practicable, organize county centennial societies, and select county centennial commissioners. Thus, without means to advertise through the country press, this fortunate method was adopted of reaching the people in the various counties in the State, and interesting them in centennial work.

At almost every institute of the hundred held, this matter was presented, and at the close of the winter hundreds of people in every county in the State were intelligently advised of the work proposed.

In the selection of commissioners to have charge of the various departments, the following had been chosen, and had accepted:

1. Dept. of History and Archaeology.....A. A. Graham, Columbus.
2. Dept. of Science and Education.....Dr. Edward Orton, Columbus.
3. Dept. of Fine Arts.....Prof. W.S. Goodnaugh, Columbus.
4. Dept. of Agriculture.....S. H. Ellis, Warren Co.
5. Dept. of Horticulture.....N. H. Albough, Montgomery Co.
6. Dept. of Floriculture.....H. Haerlin, Hamilton Co.
7. Dept. of Live Stock.....L. G. Delano, Ross Co.
8. Dept. of Mining and Metallurgy.....B. F. Perry, Ashtabula Co.
9. Dept. of Machinery.....I. D. Smead, Lucas Co.
10. Dept. of Manufactures.....J. J. Sullivan, Holmes Co.
11. Dept. of Merchandise.....W. M. Bayne, Cuyahoga Co.
12. Dept. of Commerce and Transportation.....Gen. W. D. Hamilton, Athens Co.
13. Dept. of Printing and Journalism.....R. B. Brown, Muskingum Co.
14. Dept. of Woman's Work.....Mrs. D. L. Williams, Delaware Co.
15. Dept. of Public Service and Charities...Dr. A. G. Byers, Franklin Co.

Our plan proposed, the organization of a Board of County Centennial Commissioners in each county in the State; which Board should have charge of, and be responsible for, the exhibits from their county.

This work of county organization was an immense labor. But by the month of April we had sixty-five County Centennial Societies organized, and a Board of County Centennial Commissioners in each county in the State. And through this organization every section was earnestly invited to contribute to the Exposition. The following list of County Centennial Commissioners were appointed:

COUNTY CENTENNIAL COMMISSIONERS.

Adams.

C. B. Kirker Manchester.
J. P. Duffy Manchester.

Allen.

John Berryman Lima.
T. A. Crabb South Warsaw.
J. L. B. Leatherman Harrod.

Ashland.

T. E. Myers Ashland.
W. W. Armstrong Hayesville.
R. F. Welch Polk.

Ashtabula.

E. G. Hulbert Hart's Grove.
O. P. Forbes Lindenville.
E. J. Binney Jefferson.

Athens.

Wm. Hoover Athens.
D. B. Stewart Athens.
F. S. Coultrap Nelsonville.

Auglaize.

A. P. Rinehart Uniopolis.
John S. Butcher Buckland.
Midd. Lucas Wapakonetta.

Belmont.

D. H. Darrah Bellaire.
J. M. Lewis Barnesville.
M. C. Mitchell Martin's Ferry.
A. T. McKelvey St. Clairsville.

Brown.

E. F. Blair Georgetown.
Henry C. Loudon Georgetown.
Chambers Legget Ripley.

Butler.

Geo. St. Clair Hamilton.
John Bevis Oxford.
Joseph Allen Gano.

Carroll.

J. J. McCoy Leesville.
John D. Patterson Augusta.
Joseph McGregor Carrollton.

Champaign.

S. E. Morgan King's Creek.
Johnson Leedum St. Paris.
J. E. Davis Mechanicsburg.

Clarke.

O. S. Kelley Springfield.
Wm. H. Graybill Springfield.
W. H. Sterrett Springfield.

Clermont.

S. D. Mount Williamsburg.
E. G. Penn Amelia.
Joseph Clane Bethel.
J. L. H. Barr Batavia.

Clinton.

Jeff Hilderbrand Wilmington.
Leo Weltz Wilmington.
C. Rhonemuns Reeseville.

Columbiana.

Wm. Bentley Salem.
A. H. Phillips Salem.
Edw. F. King New Lisbon.
John Pow Salem.

Coshocton.

John E. Hayes Yankee Ridge.
Capt. E. W. James Coshocton.
Lewis Demoss Coshocton.

Crawford.

Geo. Dinneworth, Jr. Bucyrus.
Henry Stuckey Bucyrus.
Jefferson Kibler New Washington.

Cuyahoga.

Hon. W. M. Bayne Cleveland.
Hon. Geo. W. Gardner Cleveland.
Mrs. N. A. Ingham Cleveland.
W. B. Hillman Cleveland.

Darke.

Hon. S. A. Hostetter Ansonia.
John Townsend Greenville.

Defiance.

Edw. Squire Defiance.
Judge Benj. M. Patton Hicksville.
A. L. Breckbill Defiance.
John Ainsworth Hicksville.

Delaware.

Prof. E. Nelson Delaware.
Geo. W. Campbell Delaware.
Thos. F. Joy Delaware.

Eric.

Calvin Caswell.....Castalia.
C. H. Rockwell.....Milan.
Hon. Jas. Douglass.....Ceylon.

Fairfield.

B. W. Carlisle.....Lancaster.
Theo. Mithoff.....Lancaster.
W. H. Huler.....Pleasantville.
J. B. Claypool.....Hooker.
Thomas Wetzler.....Lancaster.

Fayette.

H. B. Maynard.....Washington C. H.
Abram Bush.....Jeffersonville.
J. E. Mark.....Seldon.
A. R. Swope.....Bloomsburg.
T. M. Gibson.....Goodhope.

Franklin.

H. A. Weber.....Columbus.
O. W. Aldrich.....Columbus.
D. A. Ebinger.....Columbus.
J. W. Everal.....Westerville.
O. P. Chaney.....Canal Winchester.

Fulton.

I. C. Rorick.....Wauseon.
Albert Deyo.....Morenci, Mich.
D. W. H. Howard.....Wauseon.

Gallia.

I. W. McCormick.....Gallipolis.
Wm. White.....Gallipolis.
Isaac Boatman.....Cheshire.

Gettysburg.

H. H. Wells.....Claridon.
E. E. Nash.....Burton.
Wm. Howard.....Chardon.

Greene.

Horace Ankeny.....Xenia.
W. B. Baker.....Xenia.
W. J. Alexander.....Xenia.
Jacob Haines.....Bellbrook.

Guernsey.

D. D. Taylor.....Cambridge.
Wm. Borton.....Fairview.
E. A. Sproat.....Lore City.
W. J. Hester.....Cambridge.

Hamilton.

J. D. Bell.....Silverton.
Chas. Mosteller.....Sharonville.
Chas. Peckenpaugh.....Camp Dennison.
Frank Rothenkooper.....Plainville.
C. E. Ellis.....Glendale.

Hancock.

Joseph R. Kagey.....Findlay.
C. J. M. Harper.....Findlay.
Hon. David Joy.....Findlay.
Wilson Vance.....Findlay.

Hardin.

A. K. Rarey.....Kenton.
Jas. B. Pumphrey.....Kenton.
Geo. P. Frame.....Kenton.

Harrison.

Wm. H. Jamison.....Cadiz.
Joseph Holmes.....Cadiz.
John E. McPeck.....Jewett.

Henry.

Samuel Heller.....Napoleon.
Henry Rohrs.....Napoleon.
Geo. Danes.....Napoleon.

HIGHLAND.

C. S. Bell.....Hillsboro.
H. L. Dickey.....Greenfield.
H. C. Dawson.....Hillsboro.

Hocking.

E. B. Comley.....Logan.
J. W. Jones.....Haydenville.
Isaac Mathias.....Enterprise.

Holmes.

John E. Koch.....Millersburg.
A. M. Bird.....Welcome.
Chas. W. Stuber.....Killbuck.

Huron.

F. R. Loomis.....Norwalk.
J. H. Donaldson.....Greenwich.
S. H. Todd.....Wakeman.
J. C. Sheffield.....Bellevue.
A. McDonald.....Olena.

Jackson.

J. A. Sell.....Coalton.
Isaac Brown.....Jackson.
John D. Davis.....Oak Hill.

Jefferson.

Winfield Scott.....Steubenville.
Hugh Hammond.....Smithfield.
Geo. E. Scott.....Mt. Pleasant.
Benj. L. Crew.....Richmond.
T. H. Montgomery.....Toronto.

Knox.

John R. Wilson.....Mt. Vernon.
Ewing Sims.....Martinsburg.
C. E. Critchfield.....Mt. Vernon.
Chas. A. Young.....Mt. Vernon.

Lake.

J. H. Britton.....Painesville.
C. T. Marley.....Painesville.
A. C. Pepoon.....Painesville.

Lawrence.

E. Bixley.....Ironton.
Nelson Cox.....Bradrick.
J. H. Stewart.....Ironton.
A. J. Trumbo.....Hanging Rock.

Licking.

Dr. Edw. Sinnett.....Granville.
A. B. Clarke.....Newark.
Geo. J. Hagerty.....Hanover.

Logan.

I. N. Gearing.....Bellefontaine.
A. C. McClure.....New Richland.
Ezra Brown.....

Lorain.

Richard Baker.....Elyria.
Burt B. Herrick.....Wellington.
Prof. A. H. Churchill.....Oberlin.

Lucas.

W. H. Scott.....Toledo.
W. W. Farnsworth.....Waterville.
Henry L. Fowler.....Toledo.

Madison.

Geo. W. Wilson.....London.
John Weaver, jr.....Mechanicsburg.
Joseph Martin.....Range.

Mahoning.

Robert Bentley.....Youngstown.
L. E. Cochran.....Youngstown.
Allen Edwards.....Youngstown.
E. G. Marshall.....Mineral Ridge.

Marion.

Edward Huber.....Marion.
Geo. Retener.....Marion.
W. Watkins.....Prospect.
Joseph Mitchell.....Caledonia.

Medina.

F. G. Briggs.....Sharon Center.
O. P. Phillips.....Medina.
Alvin Clapp.....Chatham.

Meigs.

Jere. Carpenter.....Carpenter.

R. H. Brewster.....Pomeroy.
J. C. McCloy.....Racine.
Hon F. C. Russell.....Middleport.

Mercer.

C. E. Riley.....Celina.
S. S. Rhodes.....Fort Recovery.
M. Townsend.....Neptune.

Miami.

Timothy Munger.....Covington.
John Pierce.....Troy.
Isaac Freeman.....Rex.
D. C. Bronson.....Covington.
W. I. Tenney.....Troy.
W. H. Covault.....Casttown.

Monroe.

Hon. A. Pearson.....Woodfield.
C. W. Robinson.....Stafford.
James H. Hamilton.....Calais.

Montgomery.

Samuel Weller.....Centerville.
Wm. Gumble.....Miamisburg.
Wm. B. Dennis.....Dayton.
T. F. Longenecker.....Dayton.
A. D. Wilt.....Dayton.

Morgan.

Capt. J. S. Adair.....McConnelsville.
John A. Floyd.....Meigsville.
Eugene Swayne.....Chester Hill.

Morrow.

C. C. Clarke.....Bennington.
Wm. H. Henderson.....Harwood.
S. W. Trowbridge.....Mt. Gilead.
J. L. Swingle.....Mt. Gilead.

Muskingum.

John W. Marshall.....Zanesville.
H. C. Lillibridge.....Zanesville.
Dr. J. L. Geyer.....Norwich.

Noble.

Fulton Caldwell.....Caldwell.
J. T. Dew.....Summerfield.
John R. Gooley.....Hiramburg.

Ottawa.

Wm. Miller.....Gypsum.
Ernst Frank.....Oak Harbor.
Wm. Humlong.....Geneva.
J. H. Miller.....Gypsum.

Paulding.

Geo. W. Forder.....Antwerp.
Andrew Durfey.....Paulding.
Gilbert Barnes.....Paulding.

Perry.

Capt. H. C. Greener Somerset.
 Nelson Rodgers Corning.
 J. J. Johnson New Lexington.

Pickaway.

Capt. E. R. Black Circleville.
 Wm. Bolin Circleville.
 Jonathan Hay St. Paul.
 Newton Rector Kinderhook.

Pike.

Henry W. Sargent Waverly.
 Jos. H. Moone Waverly.
 Wells S. Jones Waverly.

Portage.

C. R. Doolittle Streetsboro.
 Frank Ford Ravenna.
 Smith Sanford Edinburg.

Preble.

Z. W. Clark New Paris.
 Wm. H. Lough Eaton.
 J. P. Sharkey Eaton.

Putnam.

Harry H. Gessels Columbus Grove.
 W. H. Hickey West Leipsic.
 L. L. Parker Ottawa.
 Homer Sackett Ottawa.

Richland.

Justin M. Waugh Mansfield.
 Harrison Mickey Shelby.
 J. L. Garber Bellville.

Ross.

Alex. Renick Chillicothe.
 Austin Brown Chillicothe.
 John Hancock Chillicothe.
 Milton McCoy Kinnikinnick.
 D. C. Anderson Frankfort.

Sandusky.

F. S. White Fremont.
 Charles Thomson Fremont.
 George B. Fuller Clyde.
 Col. W. C. LeFever Clyde.

Scioto.

R. H. Hayman Portsmouth.
 S. R. Ross Portsmouth.
 Chas. Goddard Franklin Furnace.

Seneca.

Hon. Chas. Foster Fostoria.
 Wm. P. Noble Tiffin.
 Miss Florence Cronis Tiffin.

J. P. Robinson Rockaway.
 R. R. Titus Old Fort.

Shelby.

E. E. Mitt Sidney.
 S. A. Johnson Lockington.
 G. C. Anderson Sidney.

Stark.

Wm. Maxheimer Elton.
 Andrew Pontious Canton.
 Ellis Hagan Marlboro.
 James Bayliss Massillon.
 Isaac Burton Canton.

Summit.

A. G. Osborn West Richfield.
 George W. Bailey Cuyahoga Falls.
 J. P. Sperry Talmadge.
 Wm. Crawford Cuyahoga Falls.

Trumbull.

J. J. Sullivan Warren.
 M. S. Clapp Warren.
 A. P. Laird Mesopotamia.
 James Wilson Lordstown.

Tuscarawas.

Joseph Kinsey Lock 14.
 Wm. W. Scott Canal Dover.
 J. H. Barnhill New Philadelphia.

Union.

Thos. P. Shields Watkins.
 Col. W. L. Curry Marysville.
 Prof. W. H. Cole Marysville.

Van Wert.

T. S. Gilliland Van Wert.
 A. R. Merrick Van Wert.
 W. H. Witten Shasta.
 F. L. Dustman Van Wert.

Vinton.

Dr. D. A. Rannels McArthur.
 John L. Lawler Minerton.
 Homer Jones McArthur.

Warren.

Wm. H. Robinson Red Lion.
 Josiah Morrow Lebanon.
 Samuel Irons Lebanon.

Washington.

A. W. Glazier Belpre.
 F. J. Cutter Marietta.
 Israel Devol Marietta.

Wayne.

Albert McFadden.....	Wooster.
Geo. Trautman.....	Wooster.
Jacob Freck.....	Wooster.
V. F. Wells.....	Shreve.

Williams.

David Stauffer.....	Montpelier.
Peter L. Warren.....	Stryker.
Seth P. Brosius.....	Eden.

Wood.

L. Black.....	Bowling Green.
J. H. Mitchell.....	Bowling Green.
Solomon Fries.....	Bloomington.

Wyandot.

L. W. Hull.....	Upper Sandusky.
T. W. McClure.....	Upper Sandusky.
Frank T. Tripp.....	Upper Sandusky.
Mrs. BeNe Cross.....	Upper Sandusky.
Mrs. Jennie H. Cramer.....	Upper Sandusky.

But so great an undertaking as this could not be successfully conducted without large

MEANS AND RESOURCES.

Thus far we had not been furnished by the State with any means whatever. The Board of Trade of the City of Columbus had, however, generously raised and advanced to us \$23,020 for the preliminary work of organization and advertisement.

In February, 1888, our Board petitioned the General Assembly for an appropriation of \$100,000, mainly to be used in the erection of the necessary buildings for the Exposition. Instead of this, the General Assembly gave to the State Board of Agriculture the sum of \$20,000 to be used in providing buildings for the Centennial, and authorized the State Board to bond the State Fair grounds for an additional sum of \$50,000 to be used for the same purpose. Thus the greatest amount made possibly available by the State, for the success of the Centennial, was \$70,000, and this was all to be used in erecting buildings on the grounds, leaving nothing whatever for the general expenses of organization, procuring exhibits, advertising, stationery, postage, telegraphing, expressage, travel, compensation of officers and assistants, and other expenses unavoidable in such an undertaking.

Thus we were necessarily cramped, embarrassed, and, in many things, defeated, for want of means.

GROUNDS.

The Joint Resolution of the House and Senate directed that the Exposition be held "On the Grounds of the State, used and controlled by the State Board of Agriculture for State Fair purposes."

These grounds are located two and a half miles north of the State House, at Columbus, and just outside the city limits. They are upon an elevated and beautiful plateau, overlooking the city, being upon a plane with the dome of the Capitol. They comprise one hundred and seven acres of land, and are beautifully laid out, as a permanent park, for the

annual State Agricultural Fairs. These grounds were selected and purchased, by the State Board, five years ago, and had been steadily improved, not simply by the landscape gardener, but also by the erection of elegant and commodious buildings, costing over one hundred thousand dollars. The "Bee Line" railroad runs along the full length of the western boundary line, and the Columbus & Eastern road runs within 200 paces of the south-eastern corner of the grounds, while an arm of electric street railway reaches the grounds from High street, near the line of Woodward avenue. Thus laid out, improved, and rendered accessible, these grounds were among the most elegant, commodious and inviting to be found in the country for the purpose for which they were designed.

The buildings, however, which were scarcely yet complete for the exhibits of the ordinary State Fair, though elegant in themselves, were evidently greatly inadequate in space for the accommodation of the proposed Centennial Exhibition, and additional extensive buildings must of necessity be provided for the various departments. It was decided that the buildings already erected would accommodate the Departments of History, Education, Merchandise, Machinery, Live Stock and the Public Service, leaving the other ten departments to be provided for by new buildings to be erected on the grounds. In some departments extensive improvements were found necessary to provide room and equipment for the larger display of exhibits anticipated. Notably, the equipment of Machinery or Power Hall required an outlay of \$7,000 to furnish the enlarged facilities and augmented power deemed necessary for this Exposition. In the Live Stock Department the want of an amphitheater for the special exhibitions of the various breeds and classes of cattle, demanded the expenditure of \$3,000 for the building of the same. The buildings for the Poultry show had also to be greatly enlarged and improved.

NEW BUILDINGS.

The halls necessary to be erected to accommodate the remaining ten departments, as finally determined on, were:

1. Manufacturers' or Carriage Hall.
2. Agricultural Hall.
3. Horticultural Hall.
4. Art Hall.
5. Floral Hall.
6. Hall of Metallurgy.
7. Commerce and Transportation Hall.
8. Printing and Journalism Hall.
9. Woman's Department Building.
10. An Auditorium for the various ceremonies, celebrations and entertainments contemplated.

All of these buildings seemed absolutely necessary ; but the only way they could be provided, with our limited means, was to erect, in most cases, mere temporary though capacious structures. Only in the Departments of Art and Woman's Work were permanent buildings determined on. In addition to these the Auditorium might or might not be permitted to remain for the future use of the State Board of Agriculture. But all the other halls, as planned, were to be mere temporary structures.

The three kindred departments of Agriculture, Horticulture and Floriculture were grouped together in one immense building, which was constituted of a main Hall for Agriculture, 120 x 300 feet, with end to the front; the right wing aligning to this front, 120 x 200 feet, devoted to Horticulture, and a similar left wing assigned to the Floral exhibits. These united made a building 520 feet front, by 300 feet deep, in the main part, and covering an area of 84,000 square feet. The two wings opened by these full widths into the main building, thus constituting one capacious hall for the three departments.

Manufacturers' and Carriage Hall was 100 x 300 feet, covering a space of 30,000 square feet.

Woman's Department Building, elegantly and permanently built, was 90x150 and two stories high, with gallery on all sides and splendid balcony in front. It had an exhibition space, floor and gallery, 22,000 feet.

Art Hall was substantially built of brick, with sky-light and elegantly finished walls—making a gallery where the best art work in the country might be safely and advantageously displayed.

The Halls for Metallurgy and Commerce and Transportation were of similar size and structure, being each 120x80 feet, cruciform in shape. Of like dimension was the commodious building intended for the Department of Journalism, but ultimately used for the California Exhibit. But the most unique and attractive structure planned and erected on the grounds, was the Auditorium. The celebration of the opening and welcoming days, and the assignment of special days for the celebrations of the churches, civic and industrial associations, political parties, crafts and professions, made it necessary to have an Auditorium that would shelter many thousand people. The plan determined upon was that of an immense dome, a building similar in plan and structure to the ancient Roman Coliseum. Its ground plan was an exact circle two hundred feet in diameter—its central height being 86 feet.

With no internal frame-work, its structure was that of half a spherical shell, while its external appearance was that of a vast dome resting upon the ground. Internally it was arranged as an immense amphitheater—

with terraced stage, seating a thousand singers, and audience room for 10,000 people, etc.

Scarcely has there been erected in this country a building so unique, so capacious and attractive. Bringing to mind at once, as it did, the ancient Roman Coliseum, with its amphitheater and its barbarous pastimes, it seemed historic. It was indeed a wonderful structure, and was itself worth a visit to the Centennial to see.

Besides these larger department buildings, a commodious structure for the Fire Department, and another for the various Express offices, with second story fitted for the entertainment of the Press.

Dairy building, dairy barn, dining halls, log-cabins, and other privilege buildings and booths were demanded, planned and built.

The cost of all these buildings, including their equipment, with platforms, tables and decorations, and including also the betterments in Machinery and Live Stock Departments, aggregated at least \$90,000.

While these improvements were going forward, under the direction of our building committee, acting in concert with the State Board of Agriculture, the Director General and Secretary, with their assistants, were actively pushing forward the vast work of preparation on all lines, and the commissioners of the various departments were joining in the general activity, placing themselves in communication with exhibitors and rapidly acquiring the mastery of the work of their respective departments. Superintendents and assistants were appointed in all departments where they were needed. Circulars from each department were scattered over the State, explaining the plan and scope thereof of the Exhibition. Assistant Secretary Fleming, in charge of advertising, sent his agents as far west as Kansas City and Minneapolis, north to the Canada line, east to Pittsburgh, south to Louisville and St. Louis, and scattered on all railroad lines in this vast inlying territory our splendid lithographic and other advertising matter. Mr. Buckmaster, of Fayette county, was appointed Manager of Transportation; arrangements were made with railroad lines for freight and passenger rates, and a series of excursions was planned, running through the entire forty days of the Exhibition. Invitations were sent to hundreds of leading men and women throughout the country. Notably among the invitations this Board had initiated the movement inviting the National Encampment of the Grand Army of the Republic to hold its annual session in September, 1888, at the Capital of Ohio. It was the wish of the Board in this action to bring this great patriotic reunion of the defenders of the Nation to Columbus during the continuance of the Exhibition, to add its matchless patriotic enthusiasm to the splendor of our great Centennial Jubilee. Arrangements were made with many organizations for assignment of special days, for their celebration

on the Centennial grounds. Communications were constantly kept up with county Centennial Commissioners, and with multitudes of people seeking information relating to the Exposition.

Assignments were made for many thousand exhibits, and, as the opening day approached, the departments were in a fair state of forwardness for the great event.

OPENING DAY.

By the programme that had been arranged for opening day, the pageant was to begin in the city of Columbus, with a grand military parade and review of the entire Ohio National Guard, which, for the first time in its history had been encamped in a body, for a week previous in the vicinity of the capital. It was to be a strictly military parade, of six thousand uniformed soldiers, comprising one cavalry troop, eleven regiments of infantry, and one of artillery. And they were to march in review before the Governor, and the distinguished guests. During the forenoon these troops were massed at Livingston avenue, where the column was to be formed, with right resting on High street. The reviewing stand was established on Broad street, at the north gate of the State House grounds. Shortly after eleven o'clock the State Reception Committee escorted the distinguished guests to the stand. It was a brilliant assemblage that here for a time awaited the coming of the military pageant. The splendid delegations from Massachusetts and Connecticut in full military dress, the large number of eminent men and women of Ohio, and distinguished visitors from other States made up such an assemblage as may rarely be seen, while the streets and State House grounds were crowded with tens of thousands of patriotic people anxious to witness the grand review. Led by Governor Foraker, and marching in splendid style up High street, the column moved, turned east into Broad, and passing in review, marched thence by Fourth and Gay, back to High street, and north to Goodale Park. The glitter of arms, the gay equipages, the inspiring music, and the splendid bearing of the marching column, all combined to make the parade a most imposing one, and to impress all our visitors with the splendid material out of which Ohio soldiers are made.

OPENING CEREMONIES.

At the close of the military parade, thousands of people at once repaired to the Centennial grounds, where at 2:30 o'clock the opening ceremonies were to be held. At that hour the Reception Committee conducted the distinguished guests in carriages to the grounds, and the great Coliseum was filled with thousands of expectant people. The music was

rendered by fourteen hundred school children, dressed in red, white and blue, and so arranged on the rising stage as to form a fine representation of the American flag. The magnificent Elgin Band, of Elgin, Illinois, accompanied the sweet-voiced chorus, and delighted the audience also, with its own splendid music. Governor J. B. Foraker, President of the day, called the assemblage to order. The children's chorus, accompanied by the band and audience, sang the Doxology, to the air of "Old Hundred," and Rev. Conrad Mees, of Columbus, invoked the Divine blessing. The children's chorus sang again, rendering "The Year of Jubilee," a beautiful Centennial song, written for the occasion by H. T. Chittenden, of Columbus.

CENTENNIAL SONG.

Air, "The Year of Jubilee."

The year of jubilee has come, the year of jubilee;
A hundred years have yielded up their fruits for you and me;
Where then the trackless forest spread a garden smiles to-day;
Where but the savage chased the wolf an empire now holds sway.

CHORUS.

The jubilee has come, the year of jubilee!
A hundred years have garnered up their fruits for you and me.

Ohio's sons and daughters, too, from many a distant land,
Are waiting now with eager hearts to gather in one band;
To clasp each other's hands once more and feel the joyous thrill,
Of reunited hearts that know one common mother still.

CHORUS.

In war, at bar, in art or mart, wherever men contend,
Her children have borne well their parts, have shone as foe or friend.
Amid her sisters first she stands, her star of brightest glow;
Her work well done, her name made great, her honor ne'er laid low.

CHORUS.

From beauteous Erie's sparkling wave to where Ohio shines,
From Ashtabula's pastures broad, from Hocking's fruitful mines,
From Cuyahoga's crowded port and from Montgomery's fields,
The incense comes from grateful hearts that love of country yields.

CHORUS.

From California's vine-clad hills and from Missouri's plain,
A mighty host is coming up to swell the glad refrain;
To proudly boast that of the best our mother is the peer,
And join in raising one glad shout o'er this Centennial year.

CHORUS.

The charming voices of the fourteen hundred children in the rendition of this sweet melody and appropriate sentiment filled the audience

with great enthusiasm, and an encore was demanded and given. After which Director General Hurst came forward, and addressing Governor Foraker as President of the day, presented to him the work of the Centennial Board. He said :

MR. PRESIDENT: Two years and a half ago the Board of Ohio Centennial Directors accepted the responsible trust of organizing and presenting to the people of the State and country an Exposition of the arts and industries of our people, which should fittingly demonstrate the material and educational progress, and growth of the State during its first century. With a due sense of its importance, we have given our time and our best thought and effort to this responsible work. And now, to-day, sir, we come and present to you, as the representative of this great people, the results of our united labor. We have tried to embrace, in the scope of this Exposition, every industry and interest, every field of labor and culture, and all the varied resources that, unitedly, enrich our advanced civilization. In the romantic fields of our pioneer and later history, in the advancement of education and the wonderful revelations of science, in the highest fields of thought, conception and skill in art, in the kindred departments of Agriculture, Horticulture and Floriculture, in the vast improvements of our live stock, in the developing wealth of our mineral and metallurgic resources, in the inventive departments of Mechanics and Machinery, in the boundless and varied stores of our manufactures and merchandise, in the improved methods of commerce and transportation, in the widening and charming field of woman's work, and in the humanities of our public service, we have tried to bring out all the best fruits of human thought, and achievement of skill and labor, and, by a comparison of the old with the new, illustrate the wonderful advancement of the century. It may not be denied that we have been constantly and seriously embarrassed for want of means, and by reason of this embarrassment have been compelled to deny ourselves very many things rare and curious that would have greatly enriched even the wonderful wealth of exhibits which we here present. But with the means at our command we have done our best; and though we may not have accomplished all that our thought or ambition would have achieved, still we believe that we present you here to-day an Exposition of the culture and skill, of the wealth and resources of our people, that is alike worthy of our noble Commonwealth and of the civilization of the nineteenth century. And now, on behalf of the Board, I want to tender their earnest thanks to that great army of intelligent and public-spirited men and women, who, with deep patriotism and pride of State, have aided us in this great undertaking, and shared with us its labor. And I wish also, for the Board of Directors, to express our warmest gratitude to these distinguished guests from our mother and our sister States, who have honored us with their attendance and their participation in this great Centennial Jubilee, and to assure them of our deep and cordial appreciation of their presence here to-day. And now, Mr. President, speaking for the Board, I turn over to you, and, through you, to the great citizenship of Ohio, of which you are the Chief Executive, this vast Exposition, as the result of our united labors in executing the trust which was committed to our hands.

Governor Foraker then stepped forward, but it was several minutes before the audience would permit him to proceed with his happy address. He spoke as follows :

GOVERNOR FORAKER'S ADDRESS.

MY FELLOW-CITIZENS: This Exposition is held in pursuance of a joint resolution adopted by the General Assembly of Ohio, in March, 1886. Its purpose, as expressed in this resolution, is to celebrate the material and educational progress and growth of our State during the first century of its existence. The managers having this undertaking in charge have striven to make here an exhibition that would fittingly por-

tray our achievements in these fields of labor. It is manifest, without remark, that their task has been one of comprehensive scope. All we are to-day, as a State, and as the people of a State, has been achieved during the century we are here to celebrate. One hundred years ago we were nothing. The solitude of nature reigned here undisturbed. Instead of farms, and cities, and villages, filled with a civilized people, we had only forests populated by savages and wild beasts. We had then no government, no civilization, no society of any kind. The first great work of the century was, therefore, that which was done by our pioneer fathers, who drove away the savages, felled the forests, reclaimed the swamps, and made these hills and valleys the fit abode of man, and a suitable home for a Christian civilization. It was their lot to labor in an humble and obscure sphere, but what they did forms a grand frontispiece to a grand chapter of the grandest deeds of the grandest century of all the ages. The managers of this Exposition have sought to exhibit here that which will recall these heroic men and their humble but important contribution to our greatness, and thus teach us, in the hour of our highest pride and glory, to remember, with due appreciation, the source and the labors from which our greatness has come. They have sought also to indicate the material development that has since followed—a development which no language can portray with so much eloquence as the mere statement of the figures by which it is measured.

During this century the whole of the 26,000,000 acres of our area has been subjected to the uses of man; more than 17,000 of these acres have been put under actual cultivation, with the result of an annual yield of more than 100,000,000 bushels of corn and more than 40,000,000 bushels of wheat, with all other agricultural products which our climate admits, in due proportion. We have 600 coal mines that give as an output of more than 8,000,000 tons of coal annually. We have more than 7,000 manufacturing establishments, almost as varied in character as are the wants and purposes of man, in which are invested a capital of more than \$200,000,000. In these establishments 250,000 men, women and children find remunerative employment, and from them we have products, fabrics and wares amounting annually to more than \$400,000,000, which go out into all channels of trade and commerce, to literally gather from the ends of the earth rich rewards for the labor, skill and ingenuity of our mechanics and artisans, and add to the fame and name of a progressive and enterprising people.

We have, in short, where there was nothing a century ago, a grand aggregate of nearly 4,000,000 of people, and five thousand millions of wealth. We stand as a State in the front ranks with the greatest States of the great American Union. While we have been achieving this material development, we have contributed our full share to the success of the great work that has been wrought on this continent for human liberty, human equality and the general recognition of the rights of man in his relation to government. We remember to-day, with pride, our first organic law, and we remember with gratitude, our older sister States of the Union, to which we are indebted for the great blessings that were secured to us in this respect. With generous and patriotic magnanimity, Virginia parted, for the common good, with her title to our soil, and with far-sighted statesmanship, Union-loving and God-fearing Massachusetts and Connecticut gave us our institutions as well as our first settlers. To them we are indebted for the fact that before the Constitution of the United States was adopted, we had in force here, through the agency of the Ordinance of 1787, those great energizing ideas that, "religion, morality and knowledge are essential to good government," and had vouchsafed to all citizens the right to worship God according to the dictates of their own conscience. Our unexampled prosperity has been largely due to our fidelity to these fundamental truths. In their virtue we have conquered the forests, controlled the advantages of nature, developed our material resources, educated our people, promoted morality, instilled patriotism, and gone forward in a march of unbroken triumph, winning the greatest intellectual victories. With eminent prosperity, therefore, we have to-day remembered Massachusetts and Connecticut, and with grateful appreciation we recognize and thank these States for the quick response of acceptance they made to our invitation for them to participate with us in these exercises, and with the most profound earnest-

ness I thank their distinguished representatives for the high honor they have conferred upon us by their presence with us at this time. And now a word as to our educational progress and growth.

From the beginning we have maintained and encouraged the common school system. To-day Ohio is expending for educational purposes about \$10,000,000 annually, raised by taxation. In addition we have more than 100 colleges, universities, academies and other institutions of higher learning, maintained and supported by private and corporate munificence. We have more than \$30,000,000 invested in school property, nearly 1,000,000 scholars in attendance, receiving instructions from 25,000 teachers.

At such a time I know, I may recall with propriety that Ohio has been from the beginning foremost among the States of the Union, both in the councils of the Nation and on the battle-fields of the Republic. No State has contributed more illustrious sons, or a longer line of them, to the brilliant galaxy of American statesmen.

Giddings, Wade, Chase and Stanton are but a few of those whose names will live as long as our history tells the story of human liberty and the perfection of free popular government, as wrought in the political contests of the century that has closed.

And where can be found a more inspiring chapter in all human history than that which chronicles the heroic deeds of Ohio soldiers? They have been distinguished in all our wars, but in that for the suppression of the rebellion they were particularly conspicuous. More than one-half our adult male population enlisted as private soldiers. Their blood was poured out in every conflict of that great struggle. At Vicksburg, Gettysburg, Mission Ridge, the Wilderness—everywhere. From Bull Run to Appomattox, in the south, in the west, in the east, in the north—on the sea as well as on the land—whosoever a hostile hand was raised against the flag of our country, there stood the sons of Ohio, inspired with an incomparable and unconquerable spirit of heroism and patriotism, to strike it down and punish the insult that was offered and the treason that promoted it. Grant, Sherman, Sheridan and McPherson head the list of Ohio soldiers whose names will forever illuminate the pages of American history, as the stars do shine in the firmament of heaven. Glorious is the past of Ohio, and still more glorious is the fact that our present fitting and worthy sequel of it all: we are not compelled, while glorying in the deeds of our fathers, to lament the degeneracy of their sons.

On no other spot of the globe can there be found a more general or better order of intelligence, a sounder morality, a loftier patriotism, more faithful devotion to the institutions of the government, a more contented condition of society, or a people inspired with nobler ambitions and aspirations with respect to the future. It could not be otherwise than that our hearts should be filled with gratitude toward the Most High, in whose Providence it has been our lot to enjoy such blessings. Such, briefly, are the achievements we are here to celebrate. We have sought to remember and show our appreciation for our sister States, our pioneer fathers and all who have labored and struggled during the century that is gone, for the accomplishment of the ends that have been attained. All the pursuits and vocations in which our people are engaged, all the walks and branches of learning, and all the fields of usefulness are here represented and typified, and all is now and here dedicated to the purposes intended to be subserved.

When the Governor had finished, amid applause, the chorus sang, with splendid effect, the "Star Spangled Banner," the audience rising and cheering with great delight.

Governor Foraker then rose to regret that Hon. D. W. Voorhees, who was to deliver the oration, had not as yet reached the city, and to say that if he came the Board would yet make use of him. The Governor then introduced Hon. Coates Kinney, the poet of the occasion, who read the finished production found below, in a clear voice, and with an emphasis which comes from an appreciation of the more superb passages:

OHIO CENTENNIAL ODE.

In what historic thousand years of man
 Has there been builded such a State as this?
 Yet, since the clamor of the axes ran
 Along the great woods, with the groan and hiss,
 And crash of trees, to hew thy groundsels here,
 Ohio! but a century has gone,
 And thy republic's building stands the peer
 Of any that the sun and stars shine on.

Not on a fallen empire's rubbish-heap,
 Not on old quicksands wet with the blood of wrong,
 Do the foundations of thy structure sleep,
 But on a ground of nature new and strong.
 Men that had faced the Old World seven years
 In battle, on the Old World turned their backs,
 And, quitting Old World thoughts and hopes and fears,
 With only rifle, powder-horn and axe
 For tools of civilization, won their way
 Into the wilderness, against wild men and beasts,
 And laid the wood-glooms open to the day,
 And from the sway of savagery released
 The land to nobler uses of a higher race,
 Where Labor, Knowledge, Freedom, Peace and Law
 Have wrought all miracles of dream in place
 And time—ay, more than ever dream foresaw.

A hundred years of Labor! Labor free!
 Our river ran between it and the curse,
 And freemen proved how toil can glory be.
 The heroes that Ohio took to nurse,
 (As the she-wolf the founders of old Rome)—
 Their deeds of fame let history rehearse
 And oratory celebrate; but see
 This paradise their hands have made our home!
 Nod, plumes of wheat, wave, banderoles of corn,
 Toss, orchard oriflammes, swing, wreaths of vine,
 Shout, happy farms, with voice of sheep and kine,
 For the old victories conquered here on these
 The fields of Labor, when, ere we were born,
 The Fathers fought the armies of the trees,
 And, chopping out the night chopt in the morn!

A hundred years of Knowledge! We have mixt
 More brains with Labor in the century
 Than man had done since the decree was fixt
 That Labor was his doom and dignity.
 All honor to those far-fore-working men
 Who, as they stooped their sickles in to fling,
 Or took the wheat upon their cradle's swing,
 Thought of the boy, the little citizen,
 There gathering sheaves, and planned the school for him,
 Which should wind up the clock-work of his mind
 To cunning moves of wheels, and blades that skim

Across the field, and reap and rake and bind.
 They planned the school—the woods were full of schools!
 Our learning has not soared, but it has spread;
 Ohio's intellects are sharpened tools
 To deal with daily facts, and daily bread.
 The starry peaks of Knowledge in thin air
 Her culture has not climbed, but on the plain,
 In whatsoever is to do or dare
 With mind or matter, there behold her reign.
 The axemen who chopt out the clearing here,
 Where stands the Capitol, could they to-day
 Arise and see our hundred years' display—
 Steam wagons, in their thundering career—
 Wires that a friend's voice waft across a State,
 And wires that wink a thought across the sea,
 And wires wherein imprisoned lightnings wait
 To leap forth at the turning of a key—
 Could they these shows of mind in matter note,
 Machines that almost conscious souls confess,
 Seeming to will and think—the printing press,
 Not quite intelligent to vote—
 Could they arise these marvels to behold,
 What would to them the past Republic seem—
 The state historified in volumes old,
 Or prophesied in Grecian Plato's dream!

A'hundred years of Freedom! Freedom such
 No other people on the earth had known
 'Till our America the world had shown
 What Freedom meant. No slave might touch
 Our earth, no master's lash outrage our heaven
 The Declaration of the great July.
 Fired by our Ordinance of Eighty-seven,
 Flamed from the river to the northern sky
 Ay, that flame rose against the arctic stars
 And shone a new aurora across the land,
 A body, scored with stripes of whip, and scars
 Of branding-iron, seemed to understand—
 Soulless though reckoned by our Union's past—
 That it was Man for whom that heavenly sign
 Lit up the north; and while the blood-hounds tracked
 Him foot-sore through Kentucky, stars benign
 Befriended him and brought him to our shore,
 A stranger, frightened, hungry, travel-worn,
 And we laid hands on him and gave him o'er
 Again to bondage, as in fealty sworn.
 So rich in Freedom we had none to give!
 While we might quaff, we could not pass the cup;
 No slave should touch foot to our soil and live
 Upon it slave—he must be given up!
 When that first man was wrested from our State,
 Then Slavery had crossed the Rubicon;
 Then Freedom was the whole Republic's fate;
 Then John Brown's soul began its marching on;

Then the Ohio Idea had to go
 Where'er the banner of the Union flew,
 From northmost limits in Alaskan snow
 To southmost in the Mexic waters blue.

A hundred years of Peace! Yes, less the four,
 (Our little Indian squabbles were not war)
 The four when we, in battle's shock and roar,
 Declared that Freedom was worth dying for
 Ohio gave to that great fight for Man
 Her Grant, her Sherman and her Sheridan,
 And her victorious hundred thousand more
 Victorious, yes, though legions of them sleep
 In garments rolled in blood on foughthen fields,
 Though still the mothers and the widows weep
 For the slain heroes borne home on their shields
 Their glorious victory this day behold!
 They conquered Peace; and where their manly frays
 Across the land of bondage stormed and rolled,
 Millions of grateful freemen hymn their praise,
 Ohio honors them with happy tears
 The battles that they braved for her,
 The banner that they waved for her,
 The freedom that they saved for her,
 Shall keep their laurels green a thousand years.

A hundred years of Law! The people's will,
 The right of the majority,
 The right of the minority,
 The right hand of authority,
 We promised, with the purpose to fulfill,
 But the contagion of the border-taint
 Blackened our statutes with its shameful stain,
 And left the color of our conscience faint
 'Till freshened by the battle-storm's red-rain,
 Ay, war has legislated; it has cast
 The "White Man's Government" out into night,
 And Labor, Knowledge, Freedom, Peace at last,
 Stand color-blind in Law's resplendent light.

Now hail, State of States! thy justice wins,
 Thy justice and thy valor now are one;
 Thou hast arisen, and thy little sins
 Are spots of darkness lost upon the sun,
 Thy sun is up—O, may it never set!
 These hundred years, were but thy morning red,
 It shall be forenoon for thy glory yet,
 When all who this day look on thee are dead.
 O, splendor of the noon awaiting thee!
 O, rights of man and heights of manhood free!
 Hail, beautiful Ohio! that shall be!
 Hail, Ship of State! and take our parting cheers!
 Ah, God! that we might gather here to see
 Thy sails loom in swoln with a thousand years!

Following the Centennial Ode the Elgin Band rendered several charming pieces, and then occurred the event to which many had looked forward with so much interest, the turning on of the steam and starting all the vast machinery in and around Power Hall. This event was introduced by Director General Hurst, who, in doing so, referred to the "Woman's Department," and spoke of its displays, decoration and management as a monument to the patriotism, culture and taste of the women of Ohio. He assured the ladies of the generous appreciation of the Board of what they had done to enrich and beautify the wonderful display of the Exposition; and announced that as a recognition of Ohio womanhood they had determined to invite a lady to start the machinery of the great Exposition. He then introduced Mrs. J. B. Foraker, the wife of the Governor of the State, to whom had been assigned this honor.

Mrs. Foraker was earnestly cheered as she came forward and touched the spring which started the wheels of the Exposition. All the engines on the grounds whistled and screamed, with their utmost capacity. The bands played, and the audience joined in the general uproar of enthusiasm. The children's chorus sang "America" with splendid effect.

The President of the Day then declared the Exposition duly opened. He announced the programme of welcoming ceremonies for to-morrow.

Rev. William E. Moore, of Columbus, pronounced the benediction, and the ceremonies of the first day were ended.

WELCOMING DAY.

The exercises at the Centennial grounds, on this second day of the opening ceremonies, were of absorbing interest. At 10:30 the Reception Committee arrived at the Coliseum with the State delegations, orators and other distinguished guests in carriages. The audience was not so large as on the first day, but was still large and warmly appreciated. Ex-President Hayes acted as President of the day. The bright faces and sweet voices of the children's flag-chorus were missed from the stage. But the magnificent Elgin Band was grander than ever, opening with a medley from the Chimes of Normandy, and selections from the Opera of William Tell. President Hayes introduced that veteran minister of the Gospel, Dr. Joseph M. Trimble, of Columbus. He is the son of one of Ohio's pioneer governors, and his venerable presence seemed to link together the beginning and the close of the century. In eloquent and earnest words he invoked the Divine blessing, and gratefully recounted the numberless spiritual benefactions that had accompanied and promoted our great prosperity. After another musical selection, President Hayes introduced that most eloquent son of Ohio, Gen. Wm. H. Gibson, of Tiffin, who had been

selected to deliver the address of welcome to the Mother States, Virginia, Connecticut and Massachusetts.

GENERAL GIBSON'S ADDRESS.

Addressing the visiting guests and delegations from the eastern States, General Gibson spoke as follows:

GENTLEMEN: The people of Ohio gather here to commemorate the first Centennial of their history, and by their warrant, it is made my agreeable duty to greet you as the honored representatives of Connecticut, Massachusetts and Virginia—triumphant mother of our commonwealth, and bid you welcome to our homes and hospitalities. This intelligent assemblage, and this great Exposition bear witness to what your kindred have accomplished within a hundred years.

In no era or country have the ennobling and energizing influences of Christian civilization been more strikingly exemplified than in the settlement, development and achievement wrought in our State within a century. It is little more than that period since the more ancient States you represent, then feeble and impoverished members of an insecure federation, relinquished their claims of title to the territory "Northwest of the river Ohio," and just five score years since thirty-eight New England pioneers built their cabins and inaugurated civil government on the wooded banks of the Muskingum. Then Spain wielded the scepter of despotic empire west of the Mississippi, and the mysterious realm that stretched away from the Ohio to the western ocean was an unexplored solitude, or echoed only the song and war-cry of painted barbarians. The crystal lakes and majestic rivers hid in its depths were vexed only by the Indian's rude canoe or the frail craft of devout missionaries who lifted up the unsullied banner of the cross on its shores. Tangled forests and meditating savanna challenged the enterprise of adventurous pioneers, and the hour was auspicious for some movement that should develop the possibilities; extend the boundaries and assume the power, permanency and glory of the infant republic. Educated to arms in British camps during a protracted struggle with France, our ancestors made revolution successful, coming out of that stupendous conflict crowned with freedom but bankrupt in fortune. They had restored liberty to mankind and organized influences that have been felt around the planet, and are destined to subvert every throne and hasten the enfranchisement of the oppressed millions. Such were the men, and such the achievements of those who enthusiastically led the way of empire in the northwest. The communities, gentlemen, that you represent, furnished the vanguard to this grand exodus, and swelled their ranks with eager volunteers, whose benefactions to humanity and bestowments upon their posterity were here fittingly commemorate.

Wondrous change! The thirty-eight whose voices first rang out in strains of Christian minstrelsy in the woods of the Muskingum, have passed to sanctuaries "not made with hands," and four millions of cultured people possess the land promised to their seed, but which they were only presented to view from a lofty mental Pisgah. And since Ohio became the nursery of sturdy, patriotic men, she has sent forth from her cabins and cottages fully two million cultured children to gladden the wilderness and solitary places towards the sitting sun, with the beauties of civilization. Their line of migration may be traced by the school-house and church; the well-kept farm and prosperous village; the superb city and iron highway, burdened with the teeming products of their enterprise and industry. Since heroic pioneers on the Muskingum watched around the cradle of our civic institutions with loaded rifles, nine commonwealths have joined the federal family from the north-west, and senators from Superior and the Columbia now sit in council with senators from Plymouth Rock and Jamestown, while five territories impatiently await the federal nuptials, and more than sixteen millions of freemen are happy under the panoply of law within their borders. What shall we say of Ohio's resources and capabilities? Her hills, and valleys and plains are furrowed by

the foot-prints of eight million domestic animals; her cultivated fields yield more than two hundred million bushels of grain and vegetables, and her plenteous fruits load the atmosphere with exhilarating perfumes.

Her hills are stored with minerals and her valleys are lit up with flames from the furnace and the forge. Ten hundred water-wheels and five thousand engines minister to her mines and manufactories, which yield four hundred millions of annual products and employ two hundred and fifty thousand of her people.

During the century just closed, steam has surrendered to American genius, and responds to the needs of domestic comforts and the demands of commerce, while electricity has been robbed of its terrors and trained to serve as a medium of thought. In Ohio we have near ten thousand miles of railway trackage, costing five hundred millions of dollars, while every important town and all the eighty-eight seats of justice, save one, is linked to this magnificent capitol; and the marts of trade throughout the continent by chords of steel that tremble with the weight of traffic and equalize the wealth of an internal commerce, more valuable than that of the seas. Within our borders electricity sweeps over fifty thousand miles of line, and in every village the touch of an instrument meets a response from the remotest hamlet in the Republic, and from the marts of trade beyond the ocean. Ohio has been careful to make ample provisions for the intellectual and moral culture of her people, and herein is her glory and the secret of her honored position in the Sisterhood of States. In thirteen thousand public school-houses and four hundred parochial establishments, our one million one hundred thousand children are entitled to free tuition from nineteen thousand educated instructors, at a cost to the tax-paying public of eleven million dollars annually. Colleges and academies, mostly endowed by Christian liberality, rise in every community, bringing the means of higher education within the easy reach of all. And not forgetting the teachings of the men who made us a Nation, that morality and religion were essential to the maintenance of free popular government, Ohio lifts a church-spire at all her cross-roads, and seven hundred and eighty thousand worship at their altars, while nine hundred thousand Sabbath-school children gather in their precincts. In the care of our insane, weak-minded, deaf and blind we have challenged the world's admiration, and our correctional and reforming institutions do honor to our people.

The children of our dead soldiers are nurtured and prepared for honorable careers, in homes maintained at the public expense, and soon the last disabled Ohio soldier will be taken from the poor-house to an attractive home, erected and sustained by a generous people they so heroically served. Gentlemen, behold the elder daughter of the States you represent! We present her in no fancy garments! Authentic facts put to flight the wildest dreams of fancy. We have not spoken of her jurists and divines, her poets and artists, her inventors and statesmen; nor yet of her soldiers and sailors who in every battle on land and sea fought since the star-lit banner was unfurled on Ohio soil, have vindicated their title to intrepid manhood, and shed imperishable luster upon American arms.

And now in this presence every heart should glow with unmingled gratitude to the triune God, who sustained our fathers in all their endeavors to prepare for us this goodly heritage, and who sustained us as we bore the ark of our political safety through environed seas to the mount of peace, where it now rests, shadowed by one flag and secure in the affections of sixty million freemen. Again, gentlemen, we bid you welcome to our homes and hospitalities.

At the close of General Gibson's address, which was loudly applauded the band played "Hail Columbia," which was greeted with cheers.

President Hayes then introduced Governor Brackett, of Massachusetts, whose eloquent response was received with great applause.

GOVERNOR BRACKETT'S RESPONSE.

Massachusetts cordially responds to the kind greeting of Ohio. Heartily with the spirit of this occasion, she commissions me to voice her appreciations for the courtesies extended to her, and to return her thanks for this generous welcome. To a resolve of her Legislature, thirty-nine of her citizens, representing the executive and legislative departments of her government, are present to-day in manifestation of their loyalty to the ties of kinship that bind her and Ohio together.

The number of those composing her delegation is almost equal to the number of those other Massachusetts men who, in the spring of 1788, sailed down the Ohio River on the *Mayflower* and landed at Marietta. They came to begin the settlement of the Empire State of the West. We come to-day to witness the evidences here presented of the grand results which have flowed from that beginning, and to join in the celebration of the centennial of the Ohio River upon the marvelous growth of the century which is here revealed. Thence asking the Bay State to take part in the opening exercises of the Exposition, she has extended the invitation in these words: "*Resolved*, That Ohio, as a daughter, extends to Massachusetts, as a mother, a most cordial invitation to meet her on that occasion and to participate with her in that celebration." The relationship thus suggested, which has been elsewhere referred to, is one that Massachusetts recognizes with pleasure and with pride. Like the Roman Cornelia who, according to the familiar tradition, is to be known in history, not as the daughter of Scipio, but as the mother of the Gracchi, Massachusetts, glorying as she does in her past, in the lives of men whose careers have illuminated her annals, in the institutions and the principles and the influences which have been the other causes which have combined to make her what she is, feels that she owes no higher tribute to-day than to be called the mother of Ohio. As her citizens are proud to remember, what has been here recalled, that in her town of Boston a company was organized; that Rufus Putnam and Manasseh Cutler and Benjamin Franklin and their associates in the formation of that company, and a large majority of the men who came here under its auspices, were born and reared upon her soil; that the statesmen took a leading part in framing the Ordinance of 1787, to the wisdom of which the growth, the prosperity and the character of Ohio and her sister States and the Northwest Territory are so largely due, and which, enacted the same year, the adoption of the national constitution, has been fraught with consequences so important, not only to this section, but to the whole country; that the principles embodied in that ordinance were the same in substance as those embodied in the compact entered into by the pilgrim fathers of Massachusetts, in the *Mayflower*, 167 years before, and which have exerted so potent an influence upon the character of the government and people and institutions of Massachusetts. It is a source of satisfaction to us to contemplate the character of the men who came here from Massachusetts. They did not come from her defective classes. They were not sent by her to reduce the surplus of her population. She had no surplus of that kind. The country was sparsely peopled then, and needed the services of all her sons. She did not send them here, as nations sometimes send emigrants forth, in order to escape the trouble and expense of their care and support. They were not paupers; they were not men who violated her laws, or disturbed or menaced the peace and good order of society; they did not seek to make a penal colony of Ohio, or to convert these fair prairies into a dumping-ground for the refuse of her population. Neither was the embarkation upon the second *Mayflower* induced by causes like those which led to the embarkation upon the first. The emigrants were not flying from oppression at home. They did not come here to find a fireside for the purpose of enjoying, elsewhere, a more perfect freedom of thought and of action. Their liberties had not been abridged or impaired. They were free, they were intelligent, they were law-abiding, they were capable of self-care of themselves, at home or abroad. They had enjoyed the advantages of the schools and the churches, of the social and moral influences of their native land. They had proved their patriotism by rendering her valiant service in the

Independence. Very many of them had been officers in the army. LaFayette is said to have exclaimed, on being told the names of the first settlers of Marietta, during his visit there in 1825: "I knew them well! I saw them fighting the battles of their country at Rhode Island, Brandywine, Yorktown, and on many other fields. They were the bravest of the brave; better men never lived!" They were men of culture, of correct principles, of enterprise, of courage and spirit, who saw in this vast region an ampler field for the exercise of their talents and energies, and were inspired, not only by the desire to better their condition in life under the favoring opportunities here presented, but also by the lofty ambition to engage in the enterprise of founding and building up a new State; a State which should be guided by American ideas and sympathies, and which should prevent the broad domain of the northwest from passing under any foreign domain, but keep it forever attached by indissoluble bonds to the American Union.

How much the greatness of Ohio, illustrated, not only by this exposition of her industrial resources and achievements, and of her other elements of power, but also by the part she has taken in the affairs of the republic as disclosed in the history of the century that has passed, is due to the character of her pioneers, is beyond our capacity to estimate. Whatever, in its later history, may betide a State, it never wholly deviates from the direction given to it by its founders, or outgrows the influences surrounding it in its early and formative period. The gain to Ohio from being first settled by men of this character, was a seeming loss to the State from which they came, and which could not well afford to dispense with their presence and their labor. But when we reflect upon the contributions made by Ohio and her sister States of the northwest to the nation, not only to its defense in time of war, but toward shaping its course and moulding its public opinion in time of peace; contributions in the benefits of which Massachusetts has shared in common with all the other States, we realize that ample compensation has been made for that seeming loss.

Ofttimes, both here and elsewhere, the momentous influence of that provision of the Ordinance of 1787, drafted and introduced by Nathan Dane, of Massachusetts, and earnestly and magnanimously supported by William Grayson, Richard Henry Lee and Edward Carrington, of Virginia, which made this commanding section of the republic forever free, has been the theme of oratory. The Ohio River, called by the early explorers "The Beautiful River," has a claim other than that given by its natural charms to that title, in that it marks the boundary of a region wherein nothing has ever been permitted to mar the beauty of freedom. As if prophetic of its future dedication to liberty, Washington is reported to have answered, when, at one of the darkest hours of the revolutionary war, the question was asked as to what should be done if the patriot army should be driven from the Atlantic seaboard, "We will retire to the Valley of the Ohio, and there we will be free."

Whatever Ohio owes for its progress and prosperity to its fertile soil, to its genial climate, to the exhaustless wealth of its mines, to all its other magnificent natural resources, it owes more than to them all to the fact that in its growth it has always been nurtured by the clear sunlight of liberty. It is gratifying to us from Massachusetts to remember that when, at the time the adoption of the constitution of Ohio was under consideration, in 1802, it was proposed to modify the anti-slavery clause of the ordinance, and the proposition had secured a majority of one in the convention, it was Judge Ephraim Cutler, the son of Manasseh Cutler, of Massachusetts, who, called from his sick-bed by Rufus Putnam, came to the convention and, by an eloquent appeal, changed the decision and saved Ohio to freedom. Had this not been done, had the convention persisted in its first purpose and allowed slavery, even in a modified form, to enter, it would have been like the entrance of Burr upon the enchanting island of Blennerhasset, like the entrance of the serpent into Eden. The incursion was happily prevented, and if Ohio is indebted to Manasseh Cutler for his great work at the beginning, it is indebted still more to his son for saving that work from the threatened defacement.

In responding for Massachusetts, and thus touching upon some of the credentials entitling her to the friendly regard of Ohio, I am not unmindful of what is also due to the

two other mother States, Connecticut and Virginia. They all three united in the original undertaking, and to-day unitedly share in the glory of its achievement. Connecticut is ably represented here by her Governor, and will therefore speak for herself.

— As Virginia is not represented, it may not be out of place to make a passing reference to its relation to Massachusetts and Ohio. In the address of Hon. William P. Cutler before the Ohio Historical Society, a year ago, he pertinently described that relation by saying that "Massachusetts and Virginia joined in holy wedlock, and Ohio was their first born." It may be added that the child has inherited the noblest and most distinguishing traits of both the parents. There is one particularly obvious illustration of this. For the first forty years of the republic Virginia and Massachusetts furnished all its Presidents. The faculty for doing this seems to have descended in full force from parents to offspring. Three times has Ohio given an able and honored Chief Magistrate to the Nation, and, in this presence, it is needless to suggest that her resources in this line are not yet exhausted, but that she has a rich abundance of material with which to answer any future calls of the republic.

To the people of Ohio this celebration is full of significance and interest. They stand to-day upon the boundary line which separates the century that is completed from that which is now opening before them. They may well exult at the accomplishments of the past and the assurances which they yield of still greater and more glorious accomplishments in the future. Two of the mother States, in that spirit of friendliness and sympathy which should ever prevail among the States, are present, by their representatives, to bring their salutations and unite in the festivities of the occasion, and if all the mother and sister States were here, no one of them could come with sentiments of deeper respect and warmer affection for Ohio than those which are cherished by the Commonwealth of Massachusetts.

Again the band rendered a fine selection, and Governor Lounsbury, of Connecticut, was introduced. His response was most eloquent, and completely carried away his audience.

GOVERNOR P. C. LOUNSBURY'S RESPONSE.

Connecticut comes to you to-day in full appreciation of your generous welcome. With the joy which sprang from your glad greeting is mingled admiration for your happy homes, for your fertile fields, for your unexampled prosperity. The Queen of the South has come to learn that from the beginning you laid the basis of government so wisely that no upheaval of society has ever disturbed the sure foundations. Men from the east have seen your star and have come to know that from the first you have cradled and nurtured a redeeming principle which has filled the land to the ocean, and has become the hope of the whole western world. It is right that Ohio should feel a noble pride in her grand success, but she must not forget the tribute of gratitude which she owes to her parent States. In every sphere of action her sons have wrought wonders, but you cannot too highly honor that long line of ancestors, through whose correct living and hallowed ambition have sprung your energy of body and your purity of soul.

That desire for bettering one's condition, which is so God-given that it lies at the root of liberty itself, you inherited from your grand-sires, who braved the storms of the Atlantic, and from your fathers who trod the paths through the wilderness. It is true, that in your veins courses the best blood from all the States. From every quarter you have gathered those living forces, which, filling your centers of activity and trade, have spread out until they have made the wilderness of Ohio to blossom like the rose, and to vast fields beyond your borders have carried the seeds of your enterprise and of your success. From the east and the warmer south there has come to you something of that impulsive daring, which at a dash sweeps away so many of the barriers to progress.

From the east and the colder north you have inherited that patient and sublime endurance which surmounts every obstacle. To no State in a greater degree than to Connecticut is Ohio indebted for the teaching of those great principles of right that have been alike the source of her glory and the means of her progress. Trace, if you can, one line of your ancestry to the cavalier of 250 years ago.

It will explain many of those personal charms that cheer the social life, your courtly manners, your generous hospitality, your loyalty to the ruler. But forget not to trace through New England your lineage to the Puritan and the Round-Head. He might have been disloyal to the King, but in his appreciation of individual destiny he created a State in which he and every other citizen could be at once a subject and a king, and he was loyal to liberty itself. Perhaps he had no courtliness in manner to bequeath to his descendants, but he surley transmitted the spirit of liberty and the genius of conquest.

This aggressive spirit has dominated the career of Ohio. In her infancy there was placed within her borders a new Connecticut, as a nearer center from which should radiate the light of the teachings of the mother State. For three generations the Western Reserve, in the invested worth of its virgin soil, has brightened the eye of every school-boy of Connecticut, while to all your State for all that time it has been an exhaustless treasury of intelligence and power.

It has been a grand reserve of strength and courage, from which you have drawn and never drawn in vain, in the supreme hour of every conflict. It is sometimes sneeringly asked, whether, instead of conscience, it might not have been climate that dictated freedom to the northern States. The people of New England to-day are too busy to discuss that question.

When they entered into the field of action they found freedom an accomplished fact. It was covering their hills with beauty, it was filling their valleys with the hum and the music of industry, it was pushing their civilization even to the shores of the Pacific. In their glad knowledge that slavery had not poisoned the life-blood of their States, they sought not to know whether its malaria had been destroyed in the light of conscience, or been swept away by the winds that came down from the mountain peaks of eternal frost. Of one thing they are assured, God has decreed not slavery, but liberty. If men will not listen to the still small voice, still God's decree shall stand, whether it be by the storms and snows of winter, or in the flash and roar of cannon. In the light of this knowledge my brother from Virginia grasps my hand. With hearts no longer feeling bitterness, with eyes no longer looking reproach, we gaze upon the unbroken domain of the future: and we alike thank God, who, through His immutable laws, gives to truth its victory. It is folly to ignore the logic of the century in a childish effort to forget the unpleasantness of a conflict. In one sense you are to forget even the glory which is behind as you press on to the triumphs which are before, but you cannot safely ignore the teachings of the past, whether they are written in the history of your experience or in that of some less fortunate sister State. Let nothing obscure the truth that, not by generous blood, not by courtly manners, not by cheer of hospitality, nor charm of culture, but by righteousness, is a Nation exalted. It is protection for the humblest citizen, protection to his life, to his labor, to his liberty; it is justice to all that lies at the basis of all enduring national progress. It is eternal law for the Nations that for every injustice there must be full expiation. No State can be so stable in its position, so stately in its strength that it can afford a wrong, or even a neglect to the lowest class of its citizens. In this Exposition you are building more wisely than as though you were rearing a monument on some victorious battle-field, for you are recognizing work, that one element of power which alone can insure a growing greatness to our whole country, and which will remove from every section of our land every unpleasant recollection. We can not forget by simply willing to forget. One tires of this continual looking for some bloody chasm over which to shake the fraternal hand. But time corrects all remembrances. All our sons and daughters trace their ancestry to the patriotic soldiers of the Revolution. The Tories left no progeny behind them. Time purifies and hallows all memories, but it is time that works through work. A little while and death will come

to the last lunatic who sulks in the ashes of his own defeat. A little while, and in the hum of machinery the echoes of lost battles will die out upon the ear. A little while and the lost cause will be only the dim dream of the night forgotten in the joyous activity of the day. Connecticut congratulates Ohio upon her wonderful achievements of a century. As a fond mother she will glory in your ever-increasing prosperity.

AFTERNOON SESSION.

The afternoon was devoted to welcoming the States of Indiana, Illinois, Michigan and Wisconsin. It was three o'clock when the exercises began with the splendid music of the Elgin Band. President Hayes introduced Hon. Frank Hurd, of Toledo, who was to make the welcoming address to the sister States. Mr. Hurd spoke eloquently, and was enthusiastically applauded.

MR. HURD'S SPEECH.

The growth of nations is usually slow and gradual. Their beginnings are so uncertain, that they are often lost in the obscurity of tradition or the dimness of fable. Their political institutions are the results of conditions long continued, and of customs fixed by the practices of generations. For most part their first forms of government are despotic in their nature. The leadership of one man is recognized and his will subordinates all other wills to his. The life and prosperity of the members of the community are subject to his authority. Quarrels with neighboring tribes divert attention from the ways of peace, and military law constitutes the rule of conduct. Discipline and obedience are so enforced against the common people that their lives are but little less respected than those of slaves. It is only when external dangers have disappeared that the peaceful arts are pursued. Then comes an opportunity for study and trade. Law-givers arise, who establish codes by which rules are fixed for the enjoyment and transfer of property and protection of life and personal rights. All history is but the record of this evolution, from the despotic to the democratic. Liberty always came as the result of a struggle against power. The seat of the individual is erected on the ruins of thrones. Long lines of kings held sway in Argus and Attica Lacedaemon, before free institutions were established. The laws of Lycurgus, Draco and Solon merged the individual in the State, but were absolutely inconsistent with true ideas of freedom. In Rome, before the consuls and the people, were the kings with Romulus erecting a government by force, and Numa making laws for the development of imperial greatness, rather than of individual strength. When the republic did come it was after contests of bitterness, the loss of precious lives, the horrors of war, and patriotic sacrifices never adequately known or recognized.

I have spoken of other nations to suggest the contrast between the circumstances of their origin and those of the great northwestern territory, the Centennial of whose beginning we now celebrate. One hundred years ago it was a wilderness, over the greater part of which the white man had never passed. Of its possibilities few had the faintest conception. Even its exterior boundaries were not accurately known. Within its borders what a magnificent empire was contained. On the south, the Ohio, the beautiful river, wound like a serpent through the hills and uplands covered with primeval forests until the waters were swallowed up in the greater flood of the Mississippi. On the western line, the great father of rivers, born in the placid basin of the north, hurried with its ceaseless stream to mingle with the golden waves of the Gulf of Mexico. On the north, the great fresh water seas united with the Atlantic by the St. Lawrence as a silver cord, separating it from the British possessions. Within these limits what germs of development, what foundations of future fortunes, what susceptibilities of progress. The coal fields of southern and eastern Ohio, the iron, copper and silver mines of

Michigan; the ores of Wisconsin, the natural gas and oil of northwestern Ohio and Indiana; the forests of pine and oak and walnut, and all valuable woods; the fertile valleys of the Scioto and the Wabash; the broad prairies of Illinois; the islands of Lake Erie and the banks of the Ohio with their capacity for the growth of the purple grape clusters and the wine; the possibilities of navigation, by which all products might be carried to the ocean, and the gulf; a soil of surpassing fruitfulness, and a climate healthful and invigorating—surely here was the seat of empire, and the intended home of the brave and noble race of men. Nature had spared nothing, land destined to teem with overflowing harvests; rivers carrying fertility in their touch, bearing the waters, as they fell, to their homes thousands of miles apart in the gulfs of St. Lawrence and Mexico; and the air cooled and purified by the great lakes, which no slave was ever to breathe.

This empire was claimed by three of the original colonies: Virginia, Massachusetts and Connecticut. Their contentions on the subject, with one another, as well as with the confederation, which also set up title, embarrassed congress and threatened the disruption of the Union. In the interest of patriotism and to remove the obstacle to unity, and to put to rest all doubts as to the ownership, the three commonwealths surrendered all their title in the territory to the old congress, in trust for the whole people. And what a princely gift! Never in the history of the world had there been such a donation. Territory and empire have ever been the objects of man's ambition. To secure them, the most vicious wars have been prosecuted, and the fairest places of the world have been made desolate. They organized the armies of Xerxes, and incited the spirit of adventure which tempted Alexander to the Indus. The legions of Rome were impelled by their inspiration, and theirs were the laurels of Scipio and Cæsar. They carried the banners of France to every capital of continental Europe, and wasted her armies in the snows and flames of Moscow. They have made the most beautiful lands of civilization the chess-board for the military maneuvers of kings and generals, and for Alsace and Lorraine they have involved two of the greatest nations in ceaseless conflict. But here an empire, greater than any that ever tempted avarice or ambition, was given to the United States without involving the expenditure of either life or money. And in what a noble spirit was the gift accepted! As its acquisition had not been stained by blood, it was consecrated to peace and liberty. There were no triumphant marches to celebrate the glories of its conquest, neither chariots, nor crowns, nor laurels were bestowed upon victorious generals. No prisoners were dragged from conquered provinces, and no slaves were made of the unhappy victims of defeat. No proclamation of subjection was issued, and no praetons were sent out as the representatives of imperial authority to tax and plunder. The simple foundations of republican institutions were laid upon its soil, and by a sacred compact its virgin fields were dedicated to freedom forever. While republican institutions are guaranteed to all the States by the constitutions, we who live upon the soil of that territory have additional security in the sacred pledges of the great Ordinance of 1787. For it is there declared that these articles should "be articles of compact between the original States and the people, and the States of the territory, and forever remain unalterable, except by common consent." These provided that religious liberty should be established; that the rules and processes of common law should prevail in the country, including trial by jury and habeas corpus; that *ex post facto* laws should be passed; that religion, morality and knowledge should be encouraged; that the Indians should be treated fairly, and that there should be neither slavery nor involuntary servitude, except for the punishment of crime. This was the last gift of the continental congress to the people, and in a day made certain for all time to those who should live in this territory, the rights of which had been acquired by their ancestors only after centuries of struggle and effort. This Ordinance preceded the pioneers' entrance to the wilderness, and wherever on its rivers or in its fastnesses he might make his home, it was there to welcome and protect him. It established religious liberty, while intolerance still permeated the laws of the colonies which adopted it, and human beings were being bought and sold by the very men who imposed the injunction against slavery. A forerunner to the

greater reforms of more modern days, it made one spot, and that almost the only one in the world, where human flesh did not quiver to the touch of the slave-dealer's lash, and where the clanking of the chains on his victim's limbs was not heard. It lifted up in this then remote wilderness a great light which has since shown into the darkest caverns of the earth, and in the simple word, "there shall be neither slavery nor involuntary servitude," anticipated the provisions put into the Constitution of the United States as a result of the greatest civil struggle of the world. Ordinance of 1787! Immortal instrument! It shall live undyingly with the Declaration of Independence.

The one asserted the principles by which a free people should be governed, the other applied them to the practical administration of government. The one pointed out the path, the other walked in it. The one declared that man ought to be free, the other made them free. The one was as the heralding of John the Baptist, the other as the triumph of the resurrection morn to those whose eyes were permitted to behold the future. Together they opened the era of human rights and of human equality before the law, whose culminating hour has not yet arrived, and will not arrive until kings and subjects, monarchies and thrones, privileged orders and slaves have disappeared from the earth forever. Under the beneficent guidance of this great instrument, and the Constitution and laws based upon it, what magnificent results have been attained! There is no record of such growth and development as the history of this territory presents. Out of it five empires, Ohio, Indiana, Illinois, Michigan and Wisconsin, have sprung, with to-day a population of more than ten millions. The hardy settler enduring the privation of the pioneer overcame the obstacles of nature, and soon made her subject to his toil and tillage. The enmities of hostile savage tribes were encountered and successfully resisted. The log-cabin appeared in the little clearings, from which the forests reluctantly retired. Acre after acre was, with the hardest labor, brought under the plough, and the farms were gradually extended. The settlements, at first rudely scattered, came down together. Associations of farmers in township organizations soon followed, whereby roads were built and bridges constructed to facilitate interchange. Towns were soon founded, railroads and canals were built. Great cities sprung up, called into being by the necessities of business. The erection of schools, academies and colleges showed their appreciation of the command of the great ordinance to promote education. Their purpose to encourage religion and morality was exhibited in the churches which might be seen in every neighborhood. The result is that the world does not in any part hold a population equal in size, present its equal in thrift, intelligence, culture, wealth, morality and general prosperity. Well it is that Ohio invites the people of these sister States to join in their celebration, not merely to congratulate ourselves upon having the good fortune to live upon such a soil and under such instructions, not to rejoice in the triumphs of our commonwealth, but to learn anew the lesson of our history, and to keep fresh in our minds the teachings of liberty and justice made part of our fundamental law by the compact of the Ordinance of 1787. Situated, as we are, in the center of this country, we have, as citizens of these States, a special and common interest in the federal Union, which we should develop by mutual concourse and endeavor. We are separated from the oceans by sister States and Canada. If the government of the United States should be overturned, we might be at the mercy of hostile communities which could prevent the progress of our product to the world's market. The appreciation of this fact was exhibited in the extraordinary sacrifice made by these five States to maintain the Union, and the free navigation of the Mississippi, nor shall this patriotic ardor ever grow less. Our interests as producing the necessities to our shippers of transportation by rail and water through friendly States, our traditions as inheritors of the great confederation, and our mutual participation in the benefits of the Ordinance of 1787, make it certain that no more faithful defenders of the federal Union will be found than those who dwell in the Northwest territory. In their patriotic spirit, the people of Ohio welcome to their capital city, the people of Indiana, Illinois, Michigan and Wisconsin, that they may unite with us in the Centennial celebration of our common political origin. We welcome them as joint owners with us of the soil of the Northwest territory. We welcome

them as co-heirs with us to the great legacy of liberty and justice of the Ordinance of '87. We welcome them as sharers with us in the triumphs and hopes of a common destiny.

Unfortunately the gentlemen who were to respond in behalf of the sister States were absent, with the exception of Senator L. G. Palmer, of Michigan.

SENATOR PALMER'S RESPONSE.

MR. PRESIDENT: I came from your sister State of Michigan to share with you the joy of your great Centennial Jubilee, and to bear from the Governor and people of my State a message of good-will to the people of Ohio. I come to assure you that as sharers in that common heritage of freedom guaranteed to us by the Ordinance of 1787, and as participants in that wonderful prosperity which has marked the development of the whole northwest during the century. We reach out our hands over the lakes to-day in greetings to our brothers of Ohio, and rejoice with you in your wonderful achievements and your boundless prosperity. Nay, more I came as the accredited representative of a State that in the days of the Nation's peril and extremity, stood side by side with Ohio in the battle—fighting for our flag and our country. But in the name of the patriot soldiers of Michigan, who fought in the same battle-lines with the men of Ohio, I say, hail comrades of the grand old Buckeye State!

And thus our people rejoice with you to-day, not only in your great material prosperity and marvelous growth; not only in the achievements of your labor and your skill, but also in the achievements of the undying courage and unswerving patriotism of Ohio's sons. Aye, we rejoice with you indeed over our common heritage of freedom, guaranteed by the faith of the fathers, and defended by the blood of the sons, through all these loyal States.

Sir, the Ordinance of '87, under the protection of which all the great States of the Northwest territory have grown in population, wealth and power with such great rapidity--this ordinance, I say, has been the safeguard of and defense of freedom, more than our fathers ever dreamed. Three times in our history it has been the bulwark of the Nation's freedom. Three times in our history, when the slave power menaced the life of freedom, the stalwart column of freedom in these five great central States drove back the myrmidons of slavery and pledged anew to each other their common faith in the civilization of freedom. In 1820 and in 1852 they stood like a wall against the aggressions of the slave power; and in 1861, when the Nation's life was menaced, the heart of the great Northwest throbbed and burned as never before, with the sentiment of freedom. And so from all these great States our sons went forth by tens and hundreds of thousands, to fight the great battle of liberty and free civilization in this western country.

And now, while we celebrate the event, and honor the memories of the noble men who gave us this great compact of freedom, let us not forget the heroes who defended it with their blood and with their lives. And so I say, all honor the Grand Army of the Republic! These are the men to whom the Nation owes a debt of gratitude that never can be paid.

And now, Mr. President, and men of Ohio, I want to assure you again that the people of Michigan are happy in your prosperity and proud in our relationship to you. We may have a little colder climate up there among the lakes, but our hearts are warm as yours, and they beat to-day with generous sentiments of friendship and kinship toward the people of Ohio. And now may the love of our common country and the wealth of our common heritage bind us together in the century to come, as they have in the century just closed.

At the close of Senator Palmer's eloquent response, and after music by the band, President Hayes announced the Pioneer Reunion for the following day, and the ceremonies were ended.

Thus were concluded these most impressive ceremonies of the opening days. The Ohio Centennial was happily and safely launched. Every department of the vast Exposition was in full display.

A wilderness of exhibits, covering many acres of space, invited the study, and challenged the admiration of the visiting thousands. In all departments the exhibits were creditable—in some they were the finest that this country had ever seen; and with the limited means at the command of the Board, the bringing together a collection so vast and attractive, must have impressed every thoughtful mind as the accomplishment of a great success. Thence forward the great display was well sustained through all the weeks of the allotted time, and the people of Ohio, and of all the neighboring States were invited to a continuing intellectual feast as never before was spread in the Mississippi Valley.

SPECIAL DAYS.

One of the happiest thoughts in the Centennial arrangements was the assignment of "special days" for the visitation of orders, civic societies, crafts, professions, churches and other organizations, and for their reunions and celebrations on the Centennial grounds. The first of these special days following closely the opening and welcoming days, and really continuing and prolonging those ceremonies, was held September 6, and was known as

"PIONEER DAY."

The Centennial Board had extended to all pioneers of Ohio a cordial invitation to be present on this day, and had tendered complimentary admittance to all persons who had been citizens of Ohio for seventy years. The Franklin County Pioneer Association took charge of the ceremonies, and most cordially welcomed the pioneers of the whole State.

Mr. J. E. St. Clair presided, and after music and the opening prayer by the Rev. Daniel Horlocher, made a brief address of welcome, and closed by introducing the main speaker, Judge W. J. Gilmore, of Columbus, who spoke at length, and most eloquently, of the march of the pioneers of Ohio. He was followed by Rev. Dr. J. M. Trimble, of Columbus, whose long and most active life in the ministry carried him back to those pioneer times when Ohio was a comparative wilderness.

One of the most interesting features of this pioneer celebration was the attendance and music of the "Old Folks' Singing Class," of Bellefontaine, Ohio. Dressed in the costumes of sixty years ago, they sang the old-time music, and rendered it in the vigorous and peculiar style of the old pioneers. Their singing was greatly enjoyed, and elicited the heartiest applause.

In the afternoon Mr. W. V. Lawrence, of Chillicothe, read a poem of much merit, celebrating the development of civilization in Ohio, and Judge Taylor, of Chardon, who was Speaker of the House of Representatives when Wilson Shannon was Governor, and is now 90 years of age, made a vigorous and most interesting address.

The other special days celebrated were, in succession, as follows:

2. "*Catholic Societies' Day*"—September 7, 1888. Addresses by Rt. Rev. Bishop Watterson.
3. "*Old Army Reunions*"—September 12.
4. "*Grand Army Camp-fire*"—September 13. Speeches by Gen. W. H. Gibson and others.
5. "*Patriotic Order of Sons of America*"—September 17.
6. "*State Bar Association*"—September 19. Speeches by Judge Allen G. Thurman and others.
7. "*Grangers' and Farmers' Day*"—September 20. Speeches by Col. J. H. Brigham, Gen. S. H. Hurst, Mr. S. H. Ellis and Mr. F. A. Derthick.
8. "*Knights of Pythias Day*"—September 21.
9. "*Emancipation Jubilee Day*"—September 22. Addresses by Rev. Jas. Poindexter, and Bishop B. W. Arnett. Poem, J. Madison Bell.
10. "*Labor Day*"—September 24.
11. "*Methodist Episcopal Church Day*"—September 25. Addresses by Hon. Mills Gardner, Gen. S. H. Hurst, Dr. Whitloch and Gen. Wm. H. Gibson.
12. "*Sunday-School Day*"—September 26.
13. "*School Children's Day*"—September 27. Elocutionary contest and competitive spelling-school.
14. "*Ohio Teachers' Day*"—September 28. Addresses by Jas. H. Fairchild, Oberlin; Prof. W. B. Bodine, Gambier; Hon. John Eaton, Marietta; Dr. N. S. Townshend, State University; Dr. John Hancock, Chillicothe; Miss Maria Jaques, Dayton.
15. "*Commercial Travelers' Day*"—September 29.
16. "*Presbyterian Church Day*"—October 2. Addresses by Pres. S. F. Scoville, Rev. W. E. Moore, Rev. R. C. Galbraith, Rev. G. P. Hays.
17. "*Grocers' Day*"—October 3.
18. "*Odd Fellows' Day*"—October 4. Speeches by Mayor Bruck, F. R. Gay, Findlay; W. S. Bell, Zanesville.
19. "*Ancient Order of United Workmen*"—October 5.
20. "*Columbus Day*"—October 9.
21. "*Improved Order of Red Men*"—October 10.
22. "*Prohibition Day*"—October 11. Speeches by ex-Gov. Clinton B. Fisher, Rev. M. N. Bennett.
23. "*Woman's Christian Temperance Union*"—October 12. Addresses by Miss Susan B. Anthony, ex-Gov. C. B. Fisher, Miss Emma Willard.
24. "*Locomotive Engineers, Firemen and Switchmen*"—October 16.

COUNTY EXHIBITS.

In the two departments of Agriculture and Horticulture, an earnest invitation was extended to the counties of the State to make collective county displays, and county centennial commissioners were urged to pro-

mote, if possible, such collective exhibits. To encourage citizens by counties to make these displays, the General Assembly was asked to enact a law authorizing the commissioners of any county to appropriate not to exceed \$1,000 to enable such county to make a representative county exhibit at the Ohio Centennial Exposition. This bill having been antagonized and defeated, the following act was passed :

[House Bill No. 723.]

AN ACT

To authorize the commissioners of certain counties of Ohio to appropriate funds to be used by said counties to defray expenses of making agricultural and other displays at the Ohio Centennial Exposition to be held at Columbus.

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio*, That the commissioners of said counties of Fulton and Ashtabula, Lorain, Lake, Portage, Belmont, Wayne, Harrison, Ross, Morgan, Henry, Van Wert, Miami, Clarke, Crawford, Madison, Delaware, Fairfield, Putnam, Coshocton, Holmes, Marion, Summit, Fayette, Scioto, Stark, Brown, Jefferson, Warren, Athens, Preble, Allen, Paulding, Defiance, Ottawa, Sandusky, Morrow, Montgomery, Medina, Auglaize, Erie, Greene, Clermont, Champaign, Butler, Washington, Shelby, Williams, Noble and Perry, are hereby authorized to appropriate, out of the county funds of said counties, a sum not exceeding one thousand dollars; provided, that the commissioners of Franklin, Union and Wood counties may appropriate not to exceed two thousand dollars for the purpose provided in this bill; and that the commissioners of Pickaway county may appropriate two thousand dollars to be expended for the purpose of erecting a public building upon the grounds in Columbus, and making an exhibit as provided in this bill, to be used by said commissioners for the purpose of defraying the necessary expenses of making an agricultural and other displays at the Ohio Centennial Exposition to be held at Columbus, Ohio, commencing September 4, 1888.

ELBERT L. LAMPSON,

Speaker of the House of Representatives.

THEO. F. DAVIS,

President pro tem. of the Senate.

Passed April 16, 1888.

Similar acts had already been passed, authorizing the commissioners of Muskingum and Licking counties to appropriate public money for this purpose. Thus, fifty-six counties were enabled, in the discretion of their county commissioners, to give financial aid to their county exhibits. The commissioners of many of these counties, however, declined to grant this aid, and the Centennial Boards of those counties, as a rule, felt compelled to abandon their proposed collective displays. Thus, fully one-half the county displays that had been promised were defeated. In twenty counties, however, financial aid was given, and seventeen county exhibits were made in each of these departments, making altogether thirty-four county displays.

The counties of Wayne, Stark, Wood, Union and Clarke each erected on the grounds tasteful buildings, to be used as headquarters for the people of those counties visiting the Centennial.

PREMIUMS, MEDALS AND DIPLOMAS.

In the five departments of Agriculture, Horticulture, Floriculture, Live Stock and Woman's Work, premiums were offered and awarded. Medals and diplomas were also given in lieu of premiums where they were preferred. In other departments only medals and diplomas were given, and still in others where the exhibits were all "loan exhibits," no rewards were offered. In these matters the Board conformed to what seemed to be demanded to secure exhibits, and to the usages that have obtained in expositions of this kind.

ATTENDANCE.

The encouragement and substantial support given to the Centennial Exposition by the attendance of the people during the continuance of the same, though gratifying, was not as great as the Board had hoped for, nor, as they believed, the fine exhibit merited. In this matter many things seemed to work to our disadvantage. During the month of September, when the weather was fine, and multitudes were expected to come, the railroads refused to grant the low passenger rates that had been promised, and the attendance was thus largely discouraged, while in October, when the roads conceded more favorable rates, the weather was most unpropitious, and thus again the expected attendance was largely diminished. Nevertheless, the Exposition was a great *school* of science and art—of skill and industry that richly repaid the 300,000 people who visited and studied the vast exhibit.

DEPARTMENT OF HISTORY AND ARCHÆOLOGY.

In a large sense, the Centennial Exhibition was *all* historical. It chronicled the advancement of our people in every field of thought and labor, and exhibited that final fruits of a hundred years of labor and improvement as the crowning triumph of the whole. But while the other departments were concerned more with these final achievements, this one dealt alone with the past. The relics of pioneer-life—the relics of Indian life—the relics of pre-historic life, and then, too, the relics and mementoes which mark each decade of our first century were here gathered into one great volume of history.

The classification and arrangement of these object lessons was admirably done, and the exhibits of the departments were varied, extensive and replete. In the implements of pioneer husbandry, in the furniture of the pioneer home, in the equipment of the pioneer log school-house,

in the implements of Indian and border warfare, in the currency of our early history, in the books and literature of our pioneer-life, in the arts and embellishments, as well as the utilities of those early times, in all these were written the story of our growth and enrichment in this first one hundred years, and the student of American history and archæology found here a rich feast in this vast collection.

REPORT OF COMMISSIONER A. A. GRAHAM.

To Director General S. H. Hurst:

This department was organized to embody in a distinctive feature in the Ohio Centennial—*i. e.*, to exhibit in one place—articles illustrative of the growth made in Ohio's history.

To do this properly, it was decided to group all articles into classes, regardless of ownership, each class typical of a distinct idea. This made a *collective* exhibit, and hence all individuality of ownership disappeared. This plan was decided upon after a careful examination of former expositions, and at the advice of those who had given the subject much attention.

The space allotted was the north side and east end of the gallery, in the central brick building. This gallery is twenty feet wide; at the north it is one hundred and twenty feet, and on the east eighty feet long; this gave a floor space of four thousand square feet. On this space were placed the tables, upright, and other forms of cases, in which to exhibit articles. The wall on the north presented an abrupt convex surface, about twenty feet high. That on the east was straight, with inclined sides, owing to the shape of the roof. It was sufficiently high to exhibit large maps, charts and card cases, in which were placed stone ornaments, and implements, whose owners adopt that method of keeping them. The convex surface of the north wall was used to hang paintings of the governors of Ohio, from Arthur St. Clair to Joseph B. Foraker—from 1788 to 1888. A few pictures were hung on the lower portion of the wall.

The space allotted to the department was divided into two general parts, history and archæology, the former occupying the north side, the latter the east end. These two general divisions were arranged in groups, each group in turn being classified. The division of history was separated into eight groups; that of archæology into eleven—each of which will be hereafter described.

The grouping and classification of articles enabled me to exhibit a large number, many more than could have been done by any method involving individual exhibits; and it also enabled me to present in compact form all articles illustrative of the various phases of our history. No other method would have permitted such an exhibit. Its wisdom was fully attested by the hearty approval of all visitors and contributors, when examined. By this way, the visitor saw in *one place* all that could be seen of articles typical of one idea, and hence did not have to travel all over the floor to gain an idea of utility, age, or history of the objects shown. The comparison was there.

As a result, the department became a school of object teaching, which was visited again and again, by those who wished to study what objectively illustrated our history.

To speak somewhat in detail of the department, I will note, first, the section of history, divided into eight groups, as follows: 1. Military. 2. Domestic in-door implements and utensils. 3. Domestic out-door implements. 4. Printed and written articles. 5. Mechanics' tools. 6. Money and medals. 7. Flax. 8. Pictures and paintings.

In the first group—military—were shown the classes of guns, pistols, and all firearms, swords, bayonets, dirks, uniforms, powder-horns, drums, fife, flutes, band instruments, flags, etc., etc., each class containing *within itself* every article which belonged therein, arranged so as to show chronology and utility. In this department

were special exhibits of the General Fearing and General Sheridan articles, mentioned in the annexed schedule of exhibits. Here were also a number of sections of trees from battle-fields, showing the effects of warfare in the balls and shells still imbedded in the hard wood.

In the second group were shown implements of household use; in one case were lamps, candle-sticks and lanterns, so arranged as to show the methods of lighting dwellings from the earliest period of our history to the present. Next this, came an exhibit of pewter ware of all kinds, arranged to show chronologically its use. Near this stood a case of china and earthenware, arranged on the same plan. Close by were all forms of smoothing irons.

In this group were placed musical instruments, the most valuable of which was a piano that had been in use in Washington's family.

At the request of the Woman's Department, I fitted up a "New England Kitchen" in the Woman's Building. In this were placed all articles illustrating such a department in our forefathers' homes.

In the third group—domestic out-door implements—were shown ploughs of wood and of iron, wooden pitchforks and shovels, rakes, flails, and other tools used by the farmer and husbandman when his necessities and condition compelled him to depend on "home talent" and industry for all he needed.

In the fourth group were shown all forms of printed and written mater. This embodied in one case deeds, letters, public and private documents, newspapers, receipts, etc., arranged first in classes, secondly, in chronological order. The second case contained books, and bound papers and magazines. These were arranged in classes, such as educational, religious, etc., each class, in turn, arranged chronologically.

The fifth group—that of mechanics' tools—embodied every variety of augur, brace bit, gimlet, ax, broad-ax, adze, drawing-knife, chisel, gauge, etc., while grouped among them were shown the result of work done with such tools, as wooden bowls, latches, locks, and other articles necessary to the comfort of the family.

The sixth group—money and medals—contained specimens of almost every State and private bank in the west; also one specimen of each of the chief coins in use during the century. Six double cases were required to hold the currency, and one upright triangular case, two sides of which were used, held the coins. In all, there were upwards of two thousand specimens of currency, comprising not only Ohio and Western bank currency, but also many specimens belonging to foreign banks and corporations, and also of Colonial, Continental and United States issues. The coins contained specimens of all used in this country from the periods of early settlements in America to the present time—gold, silver and copper; in all, about one thousand pieces. The entire collection was the exhibit of A. H. Smith, of Burg Hill, Trumbull county. A few smaller collections were also shown.

The medals were chiefly in a case shown by Dr. Eli D. Pocock, of Shreve, Wayne county, and exhibited many of the medals, or their duplicates, issued to individuals in the west.

The exhibit of flax—group 7—comprised, in one series, the entire method of converting the raw product into cloth. This, of course, included all machinery and appliances used. The exhibit was gathered and arranged by John Hayden, Esq., of Marengo Morrow county.

The eighth and last group in this division—that of pictures and paintings—was somewhat scattered, owing to the nature of the wall space. In addition to the portraits of Governors, already mentioned, there was a variety of pictures, paintings, charts, commissions, wall-cases of badges, diplomas, etc., illustrating various phases of our history. In this exhibit were shown two cases containing a complete inventory of all circulars, letter heads, envelopes, designs, cards, badges, etc., used at the centennial celebration

held in Marietta, July 15, commemorative of the proclamation of civil government by General Arthur St. Clair, July 15, 1788.

The foregoing gives an outline of the historical section. The list of exhibitors and articles shows the details of the division.

The arrangement of the second division—Archæology—was mainly the work of Prof. M. C. Read, of Hudson. Ten general groups were made, each in turn classified. The groups were—

1. Casts and models of earthworks.
2. Larger stone implements.
3. Bone and shell ornaments and implements.
4. Human remains from mounds.
5. Slate implements and ornaments.
6. Pottery, domestic utensils, dress, etc.
7. Worked flint implements.
8. Pipes.
9. Maps and specimens in wall-cases.
10. Miscellaneous articles.

Without going into details, little can be said of each of the above groups.

The first comprised casts and models in clay of the typical mounds and earthworks on one table, while adjoining it was a model drawn to scale of the earthworks found on the site of Marietta, at its settlement in 1788.

The second group contained varieties of pestles, mortars, axes, hammers, mauls, fleshers, and other large stone implements, each comprising a class, each class in turn being arranged according to evident use.

The third group comprised all articles of shell and bone, including beads, bodkins, fish-hooks, and spears, disks, etc., etc.

The fourth group comprised, in one case, the types of crania and skeletons found in mounds and in Indian burial places. These included several perfect skulls, and fragments of skulls, as well as entire skeletons and parts of skeletons.

The fifth group comprised the various forms of slate implements and ornaments, such as beads, wands, badges, fleshers, bark-peelers, tribal, clan and family totems, each class being arranged in order of use.

The sixth group included a typical variety of pottery of mound, Indian, and modern Mexican tribes. Many fragments were also exhibited, showing the various styles of ornamentation prevailing, especially in this part of the country.

The seventh group included a variety of domestic utensils used among the aborigines, also ornaments of copper, bone, iron, silver, brass, reeds, etc. Among these were also shown many articles now in common use among western tribes, as deer and other skin dressed and ornamented for garments, platters of woven grass and other things.

The eighth group included what might with propriety be termed the "evolution of the pipe." Here were shown all forms of smoking utensils, from the earliest straight stem without a bowl, to the elaborate carved bowl and stem of the modern Indian. Also many forms of ceremonial and clan or tribal pipes, as well as those of an emblematical character, were exhibited in the case containing this group.

The ninth group contained all varieties of stone implements and ornaments, exhibited in frames, the articles being fastened by small wires to the back of the frames; Dr. Pocock, John S. B. Matson, of Richland county, H. B. Case, of Ashland county, M. E. Thrailkill, of Franklin county, and the Ohio Archæological and Historical Society being the chief contributors to this group. A large archæological map, belonging to the Society, showing the principal earthworks, mounds, etc., in Ohio, was hung here; near it was a small map of Delaware county, on a similar plan, prepared by R. E. Hills, Esq., of Delaware. A number of drawings of archæological articles were also shown.

The tenth group included what was brought in after the classification was completed and the cases filled, hence here were placed all unclassified articles.

But little more need be said concerning this general grouping and classification. Every group and class was properly described by labels, while to each article that admitted it, was attached a special label giving all known information as briefly as possible regarding it. This was not generally necessary in the archaeological division, as the label for a class answered sufficiently for all articles in the class. In the historical division, almost every article had a special and separate history, and hence bore a special label. This was a great convenience to visitors, and was much commended. It obviated all necessity for guides, and besides, left each one at full discretion as regarded time of examination of the articles.

It only remains for me to speak of my assistants, Capt. H. C. Roby, in charge of the military section, and part of the historical division, and Dr. L. C. Herrick, who had charge of the eastern end of the historical section and of the archaeology. Each was constant in duty, faithful and courteous to all, and ever ready to do all required at their hands.

DEPARTMENT OF SCIENCE AND EDUCATION.

From the first it had been the purpose of the Board to give large consideration to exhibits illustrating the educational advancement of the State, in the lines of ordinary school work, higher education, practical science, literature, art, so that this exposition should not only mark our advancement in material wealth and resource, but should also chronicle the growth of the immaterial, the educational and intellectual wealth of our people.

It was hoped that all the schools, colleges and universities of the State would become interested and would contribute something to this educational exhibit. Many things mitigated against this general response, and yet, as will be seen by the report of the commissioner of this department, the exhibit actually made was in a large sense representative of all these lines of educational labor and achievement.

REPORT OF COMMISSIONER H. A. THOMPSON.

Gen. S. H. Hurst, Director General, Ohio Centennial Exposition :

DEAR SIR: As Commissioner of the Educational Department of the Ohio Centennial Exposition, I have the honor of submitting the following report :

When the duties of my official position were entered upon, which was not until nearly the first of May, the district schools of the State were largely closed.

Prof. Edward Orton, of Columbus, first chosen as commissioner of this department, had felt himself compelled by the pressure of other official duties to resign the position ; and when, at the earnest request of yourself and Professor Orton, I agreed to take his place, I was impressed with the magnitude of the undertaking and the shortness of time in which to work up the exhibit for my department. Moreover, the fund at my disposal was so meagre, that extensive travel or personal visitation over the State to secure material for my exhibit was impossible. Hence, the work had to be done at long range, and under very many difficulties and disadvantages. It was therefore accomplished almost

entirely by circulars and a very extended correspondence. Very many of the people whom I thus addressed responded helpfully as far as they understood the case and circumstances would allow; and I gratefully and gladly acknowledge, here and now, the helpful, cordial assistance I received from superintendents, teachers and others throughout the State.

Before his resignation of the position of Commissioner, Prof. Orton issued an explanatory circular to the district schools of the State, and announced therein that others would follow. These were prepared and issued and the work unfolded and developed, and their preparation was found to be necessary or advisable. In this way circulars were prepared and mailed to the educational institutions of different grades and orders throughout the State. Some personal trips and visits were made to different parts of the State, as their necessity became apparent.

The north brick building on the Centennial grounds was allotted to me, and the educational and scientific exhibits I was enabled to gather together occupied the large bulk of the space in the building. A portion of the building was occupied by the exhibits of the Associated Public Charities, a report of which will no doubt be made by Dr. A. G. Byers, Commissioner.

In due time workmen arranged the building for the display of my exhibits according to plans I had proposed, and by the use of platforms, railings and partitions the building was suitably subdivided into departments, sections and alcoves, with suitable aisles between. A pretty semi-circular tower in the northwest corner was selected as the office of the Commissioner, and spaces large and small assigned to the hundred and more exhibitors whose exhibits began to arrive, and as rapidly as possible were unpacked and placed in position. In spite of many delays, hindrances and vexatious disappointments of various sorts, opening day, September 4, 1888, found our building nearer absolute and final completion and arrangement than any other department in the grounds, as our many visitors freely testified.

The exhibit was practically in place and only finishing touches remained to be added, besides the general decorations on an extended scale, which adorned our large and handsome building. We arranged, on a delicate, yet elaborate, though inexpensive, plan of decoration, adornment and outfittings, a parlor or reception room in connection with the office of the Commissioner. This room, with its dainty appointments, easy chairs, pretty ornamentation and home-like atmosphere, was the transient home and resting-place of hundreds, indeed, thousands, of grateful visitors during the Centennial. The Assistant Commissioner of my department, Miss J. C. DeVelling, proved herself a most successful and accomplished hostess, and the continuous expressions of appreciation testified to her success. One of the very interesting features in this room was a handsome hand-carved book-case, the work of Miss Julia A. Frankenburg, of Columbus. In this book-case was displayed over 300 volumes, on a great variety of subjects, the work of Ohio authors. Nearly all of this fine collection of books were generously donated by their authors and publishers to the Ohio Historical and Archaeological Society.

On the right and south of this office and reception room, was a double alcove, occupied by a fine exhibit of banners and other tasteful and dainty decorations, representing the State W. C. T. U., and a large number of local unions. They had for sale and free distribution a large assortment of temperance literature, and a number of ladies were in attendance to distribute literature, and explain their work and its aims and objects. Next in order, on the south, was another double alcove, in charge of representatives of the Sunday School Union. They displayed a large collection of Sunday School literature, and also many maps, charts, photographs of people and places; and as a whole, no more interesting or instructive exhibit had place in the building.

A large alcove, next the Sunday School Union exhibit, was filled with wall maps from Rand & McNalley, Chicago, and a large and fine collection of framed photographs of school and college buildings in various parts of the State. Next to this came the alcove devoted to the Equal Suffrage Association. Here a fine display of pictures of

prominent men and women who are and have been friends and supporters of their work adorned the walls, and an extensive assortment of equal suffrage literature was freely distributed by the ladies constantly in attendance. Across the aisle to the south, and beyond the west doorway, an alcove contained a handsome collection of Florida curiosities, displayed by Dr. O. H. Houghton, of Westerville. The representatives of an Educational Lecture Bureau also occupied this space.

The west large alcove was occupied by a full display of public school work, from the schools of Coshocton. The alcove containing the elaborate display of work done in the Columbus Art School came next, and joined on the south by a large and comprehensive exhibit of work of all kinds done in the Columbus public schools. This large exhibit occupied the southwest corner of the building, and extended half way across the south end.

Across the aisle, beyond the south door, a collection of skeletons, manikins and automatical drawings greeted the throngs of visitors. They were more instructive than beautiful, no doubt the visitors concluded, but they were useful and educational. A very pretty display of kindergarten work, and methods, filled the neat alcove to the east, and the southeast corner of the building was occupied by a handsome display of portraits, books and other things, from Heidelberg College, of Tiffin. Beyond this, on the east side of the house, was displayed the fine exhibits from the Associated Public Charity Institutions of the State, which Commissioner Byers will report. These exhibits occupied almost one-half of the alcoves on both sides the aisle of the eastern side of the house. The Meteorological Bureau of Ohio presented an interesting display in an alcove opposite the eastern entrance to the building; the other half of the eastern side of the building was occupied by a very complete display of all the departments of the Ohio State University, at Columbus. This display was beautifully arranged (as, indeed, were all the displays), and reflected great credit on the institution and all concerned in its representation. The various departments represented occupied almost a quarter of the entire building, extending from the eastern entrance around all the way to the north door.

Near by was an elevated platform with accompanying auditorium containing 150 chairs for public exhibitions of various kinds, which exhibitions were furnished by the officers and pupils of the several public institutions in Columbus. This platform occupied one of the largest spaces in the building, and was situated at the north end of the building. A number of free entertainments of different kinds were given here during the continuance of the Exposition, and proved a popular and profitable feature of life in the Educational Department. In the rear of this platform was a pioneer school-house, built of logs which grew in Licking township, Licking county. It was fitted together in its forest home, then brought to Columbus and rebuilt in the Educational building. It had the old-time chimney, door with wooden hinges, and wooden latch, with the veritable and historic "latch-string" *hanging out*. Its puncheon floor, slab benches and desk, or shelf, around the wall, was a forceful reminder of "ye olden time." The shingles were hand-made and the roof was held down by poles fastened down by wooden pegs. According to ancient customs, wooden pegs and pins were used instead of nails in the construction of the house. The "school-master" seemed *to be abroad*, but he was well represented by his "assistant," said assistant being a large bunch of birch-rods from five to seven feet long, which stood menacingly in the corner, commanding attention and maintaining order. This pioneer school-house received much attention and interest. It was made and presented by citizens of Licking county.

In the rear of this was a large display of the work of the Normal Training School, of Columbus; and a large and fine assortment of goods from A. H. Smythe's book and stationery store, of Columbus. In this same section of the building was a large and most interesting assortment of specimens of various departments of the extensive and valuable cabinet of the Ohio Wesleyan University, of Delaware. On the east side of this section, and across the aisle, were alcoves occupied by the Ganenin College of Pen Art, Circleville Public Schools; a large collection of pen-knife work in wood (Capt.

J. R. Greene, of Lancaster, exhibitor); the public schools of Lima, a collection of finely prepared architectural designs, and the Capital City Commercial College. All had fine and enjoyable exhibits, in which much skill and labor were shown. Across the aisle, on the west side of this central section, where the school-house and cases of minerals and curiosities stood, were alcoves occupied by Cole's Electric Supply Co., of Columbus; Columbus Business College, Denison University, at Granville; Ohio University, at Athens; Wilberforce University, Xenia; Otterbein University, Westerville, and Buchtel College, of Akron. All had displays which attracted the visitor and added much to the interest of the general exhibit. The display of Buchtel College was especially fine, of great variety, and arranged with great taste and care.

The alcoves on the opposite side of the partition in this section, faced on the west side of the house, and contained exhibits from Michael's College, Pen Art, of Delaware; Canton Public Schools, Massillon Public Schools, Oberlin College, Oberlin; Wesleyan Female College, Cincinnati; Kenyon College, Military Academy, Gambier; Baldwin University, Berea; Wittenberg College, Springfield; Lake Erie Seminary, Painesville; Toledo Normal Training School, Toledo; Norwalk Public Schools, buildings; Cory Public Schools, buildings; Portsmouth Public Schools; Springfield Public Schools; Chillicothe Public Schools; and photographs of the district school-houses of Plain township, Stark county, Ohio. There was much book-work, designing and drawing, and some oil paintings among these exhibits; but it was quite largely a collection of framed photographs, and other pictures of college and school buildings; of prominent educators, and specimens of fine work done by pupils. Just north of the west entrance was a large platform surrounded by railings. The southern end of this was occupied by fine displays of optical and mathematical instruments, H. Cole, of Columbus, exhibitor. Fauth & Co., of Washington City, D. C., had a handsome display of engineering instruments. H. Cole had charge of this display. The Cornell Pheneger Co., of Columbus, exhibited a very comprehensive display of trusses, crutches, invalid goods, and surgical instruments. The rest of this platform was occupied by (9) nine large tables, containing show cases filled with curiosities, relics and photographs, and the tables were loaded with bound volumes of school-work, from the following public schools of the State: Cleveland, Ganesville, Kent, Newark, Cambridge, Marysville, Mansfield, Woodstock, Lancaster, Ashtabula, Marietta, Bellaire, Mt. Vernon, Fostoria, Mt. Sterling, London, New Paris, Canal Fulton, Columbiana, Peninsula, Columbus Grove, Milford Center, Poland, Perrysburg, St. Clairsville, Hudson, Elyria, Waverly, Hicksville, Beaver Creek, Richwood, Wheelersburg, Kirkersville, Wilmington, Garrettsville, Winesburg, Adelphi, Harveysburg, El Dorado, Jacksontown, Hopedale, Eaton, Hebron, Clarke county ungraded schools, Mt. Union College, Columbus Art School, Columbus; Cleveland Manual Training Schools, Cleveland; Clarke County Ungraded Schools, Clarke County; Teachers' "Blue Book," by M. Joseph Boyd, Dayton. Rand & McNalley (display of maps), Chicago, Illinois. Best collection old and rare books, Prof. O. W. Aldrich, Columbus, Ohio.

Medals were given to the following: Denison University, Granville, Ohio; Heidelberg College, Tiffin, Ohio; Wilberforce University, Xenia, Ohio; Mt. Union College, Alliance, Ohio.

Public Schools: Mt. Sterling, London, New Paris, Canal Fulton, Columbiana, Peninsula, Columbus Grove, Milford Center, Poland, Perrysburg, St. Clairsville, Hudson, Elyria, Waverly, Hicksville, Beaver Creek, Richwood, Bethel township.

The following were recorded as worthy of honorable mention, for public school work: Wheelersburg, Ohio, Kirkersville, Wilmington, Garrettsville, Winesburg, Adelphi, Harveysburg, El Dorado, Jacksontown, Hopedale, Eaton, Hebron, Harrison township Licking county, Jefferson township, Preble county, New Lyme Institute, New South Lyme, Ashtabula county, Ohio. Teachers' examination papers from Stark, Defiance and Ottawa counties, Alliance. This book-work was very comprehensive in variety, and very much of it of superior style and grade. The places named were represented by different numbers of volumes of work, from one to fifty-four, Zanesville furnishing th

highest number. The show-cases contained relics and curiosities from many places and exhibitors, which visitors enjoyed and found a very interesting study. A collection of over two hundred photographs of Ohio teachers and others, had an honored position in this exhibit. Several collections of old and rare books were also displayed here. The finest was by Mr. O. W. Aldrich, of Columbus.

Suspended from the ceiling, over the west aisle in the building, were 17 graphic maps that gave to the eye a clear and full idea of the growth of educational work in Ohio. One of these represented by broken lines the number of male and female teachers in the State from 1837 to 1887. Another, the total number of pupils of school age in the State, with number enrolled, and average daily attendance. Another, the average monthly wages of teachers, male and female, of high and primary schools from 1854 to 1887. Another, the average monthly wages of male and female teachers of common schools in Ohio from 1854 to 1887. Another, the total expenditures for school purposes, and total expenditures for teachers of the State of Ohio, from 1837 to 1887. Another, showing to the eye, by a large circle, the comparative number of boys and girls enrolled and their attendance. Another, the number of school-houses built each year from 1841 to 1887. Another, the pupils studying arithmetic and geography. Another reading, and another writing. One giving the enrollment, another the per cent. with the enrollment and average attendance, was the total youth from 1850 to 1887. Another, showing the number of teachers and number of schools each year, from 1841 to 1887. Another, showing average number of pupils per teacher in each county. Another, the average number of pupils in attendance to each school-room for 1887. Another, showing per cent. which the attendance was of the enrollment in the several counties of the State. These maps are full of interest, and attracted the attention of all thoughtful people.

A Committee of Award was appointed to give honorary awards to the exhibitors and exhibits in the Educational Building. The following are the names of those forming the committee: Prof. Eli T. Tappan, State Superintendent of Public Schools of Ohio; Mr. L. D. Bonebrake, A. M., Superintendent of Public Schools of Athens; Mrs. Helen Olmstead, Artist, Cleveland, Ohio; Professor Josephine Johnson, A. M., of Otterbein University, Westerville, Ohio.

By special request, the committee was increased by the addition of the names of Rev. Dr. A. H. Thompson, Commissioner, and Miss J. C. DeVelling, Assistant Commissioner of the Department. Prof. Tappan was prostrated with what proved to be his death-sickness the very day the committee met to perform their official duties. The other members of the committee performed the duties of their office as best they could under all the circumstances, and through Miss J. C. DeVelling made the following report:

DEPARTMENT OF SCIENCE AND EDUCATION OF THE OHIO CENTENNIAL EXPOSITION.

The committee appointed to make examination of the various exhibits in the Educational Building, made the following recommendations: As deserving a *silver medal*, for general or special worthiness, the following list of exhibits and exhibitors: Ohio State University, Columbus, Ohio; Columbus Public Schools, Columbus, Ohio; Buchtel College, Akron, Ohio; Ohio Wesleyan University, Delaware, Ohio; Oberlin College, Oberlin, Ohio; Ohio University, Athens, Ohio; Capital City Commercial College, Columbus, Ohio; Columbus Business College, Columbus, Ohio; Zanerian College, Pen Art, Columbus, Ohio; Michael's College, Pen Art, Delaware, Ohio.

Public School Work—Lima, Cleveland, Chillicothe, Circleville, Canton, Zanesville, Fostoria, Cambridge, Massillon, Wadsworth, Kent, Mt. Vernon, Coshocton, Mansfield, Lancaster, Newark, Bellaire, Portsmouth, Ashtabula, Marietta and Springfield.

The elocutionary contest and competitive spelling school were interesting features of the programme for Public School Day, September 27th.

The addresses on Teachers' Day (September 28th) were of a very high order. James H. Fairchild, D. D., President Oberlin College; Wm. B. Bodine, D. D., President Ken-

yon College; Hon. Geo. Eaton, L.L. D., President Marietta College; Prof. Norton S. Townshend, M. D., Ohio State University; Superintendent John Hancock, Ph. D., Chillicothe, Ohio, were the speakers on this occasion.

Where so many aided to make the department a success, it is not possible to mention names, and the commissioner can only return his hearty thanks to all those who so generously aided him in his arduous work. Special mention should be made of Mrs. H. VanPiper, of Circleville, Ohio, whose experience and taste were of great value in setting the exhibits in place. To Prof. Edward Orton, of Columbus, for valuable counsel and help in preparing circulars, and to the competent and faithful assistant, Miss S. C. DeVelling, to whose good taste and unfailing labors, much of the success of this department is due. My sincere thanks are hereby tendered to Gen. S. H. Hurst, the Director General, and Mr. L. N. Bonham, the efficient Secretary, for counsel and co-operation so generously afforded, and which did much to make the department, in the judgment of not a few, one of the most interesting buildings on the grounds.

Respectfully submitted.

H. A. THOMPSON, *Commissioner.*

ART DEPARTMENT.

In the Department of Fine Arts the Board was ambitious to present a collection of the very best art work produced in this country, that they might illustrate in this department, as well as in others, the highest achievements of American genius and skill. They had erected an unpretentious but elegant Art Hall, where the most costly works of art might be safely and advantageously displayed. And they were most fortunate in securing the services of a commissioner of this department who was not only an enthusiast in art himself, but who, having accepted this most responsible position, gave himself to the work with a zeal and intelligence that insured success. His main aim was to bring together a collection of representative American paintings of such high character and varied excellence as had never before been seen in this western country. His efforts were rewarded beyond expectation. Over six hundred paintings from the studios of the best American artists, east and west, filled the galleries of this department. New York, Boston, Philadelphia and Chicago contributed liberally from their best galleries, and Ohio artists, at home and abroad, took pride in sending their finest productions; and, as a result, we had, as many admiring visitors declared, the largest and best collection of American art ever brought together in the West. The Art Catalogue of the department was also beautiful and complete, and the successful management of the entire department received the warmest commendation of the Board.

REPORT OF COMMISSIONER WALTER S. GOODNOUGH.

To Director General S. H. Hurst:

DEAR SIR: The importance of a creditable Art Department in the Ohio Centennial Exposition, and the labor necessary to accomplish it, were evidently fully recognized by the Board of Directors, in the early appointment of a commissioner of that department. Active work was commenced in the summer of 1887. It was determined not to confine the exhibits to works of art owned in Ohio, or produced by Ohio artists, but to obtain as representative a collection of American paintings as possible, making special effort to secure works from resident artists of reputation, and from artists formerly residents of Ohio, but who have since gained fame in the art centers of the East.

The first steps were to learn the methods of other expositions which had gathered creditable art collections, and also (as properly constructed art galleries are the first essential requisites towards securing a worthy collection) to collect data which would be of value in the designing of a building for the purpose. The months of July and August, 1887, were spent in visiting the art galleries of Cincinnati, Chicago, New York, Boston and Philadelphia, examining their construction, proportions and lighting, and making sketches and measurements for future use. At the same time visits were made to the leading artists of those cities, interesting them in the exposition, and preparing a way for a contribution of their works. Another very important arrangement made at this time was the selecting of the proper firm of picture dealers in each of the above named cities, one whose charges would be reasonable and fair, and who at the same time should have the confidence of artists, to act as our agents.

The duties of these agents were to collect from the artists' studios such pictures as had been solicited; or were desired, box and ship them to us at the proper time, receive them at the close of the Exposition, unpack and return to the artists.

It was at first thought that circulars to artists would be sufficient, but with six other exhibitions in the field soliciting works of art for exhibition during the same month, and all hoping to get the best from the great eastern art centers, it was soon felt that personal solicitation was necessary to success. It being impossible for the commissioner to leave Columbus at the time of the spring exhibitions in New York and elsewhere—that time being the most favorable for the selection of works—and it being necessary for some one to be on the grounds before the best works should be promised elsewhere, Mr. Perry P. Smythe was appointed Superintendent of the Art Department, and sent on this mission. The artists were somewhat prepared by circulars, which had already been sent to them, and by the visits of the commissioner to many of them during the previous summer. All the inducements offered by other expositions were also offered by us, and a fine and large collection was obtained. Mr. Smythe visited New York only, pictures from other points being obtained by the commissioner through correspondence or personal visitation.

The catalogue shows that there were 615 (six hundred and fifteen) paintings, besides other works, in the Art Department; there were also 155 (one hundred and fifty-five) pictures additional to this number in the Woman's Department. Of these 615 paintings, about half were from New York; from Boston, 31; from Philadelphia, 40; from Washington, 3; from Chicago, 13; from Baltimore, 1, and the balance from Ohio.

The collection represented the very best artists in the United States, as a reference to the catalogue will show to those familiar with the art world. Several of the best contributions were painted expressly for this exhibition.

The exhibition received high praise on every hand, as being modern, fresh, attractive, and strictly American. That it was appreciated was apparent from the crowds that thronged the building from early morning until after other buildings were closed at night, on all pleasant days, and even on many stormy ones.

The Art Department building, a permanent one of brick, with a glass roof, proved admirably adapted for the purpose. Several eastern artists who visited the Exposition,

declared there was not a poor place on the walls, all paintings being equally well lighted—the light under control by means of curtains—and the galleries well proportioned. The building is 60x90 feet, and is divided into four galleries, with an office and store-room. The hanging space on the walls is covered with felt cloth of suitable color, and the cove and dado decorated in fresco.

Before they could gain admission, all works proposed for exhibition in the Art Department were submitted to a judging committee, and were passed upon according to their merit. Quite a large number were rejected. The hanging was placed in the hands of a committee of artists, who discharged their difficult tasks with great credit.

It was decided to grant no premiums in the art department, as they would have to be of considerable value to be an object to artists, many of whose works were valued from \$1,000 (one thousand dollars) upwards. All the pictures, with a few exceptions, were for sale, however, at the prices published in the catalogue, as patronage in this way of purchase is the strongest inducement for artists to send their work to exhibitions. Twenty pictures were sold.

The total value of the pictures in the entire collection was about \$200,000 (two hundred thousand dollars).

In the photographic section, medals were awarded as follows:

J. Leandy, Cincinnati: Silver medal for his two photographic compositions.

J. F. Ryder, Cleveland: Silver medal for general display. Bronze medal for photograph of old man.

J. M. Elliot: Bronze medal for crayon portrait of Judge Thurman.

L. M. Baker: Bronze medal for general display of cabinet photographs.

Respectfully submitted.

WALTER S. GOODNOUGH,
Commissioner Art Department.

DEPARTMENT OF HORTICULTURE.

The large Horticultural Hall erected to accommodate the fruit display at the Exposition—the preparations made for “cold storage” of early fruits, and the active co-operation of the State Horticultural Society, and many local Horticultural Societies—were supplemented by a splendid crop of almost every variety of fruit grown in the State, so that the conditions necessary for a fine exhibit all combined to insure success in this department.

The tables, containing nearly 7,000 plates of fruit of all varieties, were kept constantly replenished during the entire forty days. Three periods were named for special shows for premiums, namely, the first, third and fifth week, and three separate awards were made, so that the Southern, Central and Northern sections of the State might have equal advantage in the exhibition of their ripened fruits. As a rule, all fruits were removed at these periods, so that the Exposition brought in during these weeks not less than 20,000 separate plates of fruit. We submit that 800 varieties of nearly perfect fruit, shown by 20,000 specimen plates, have never before been seen in an American Exposition.

The seventeen counties which entered the contest for premiums on county display of fruits in variety, each showed 200 plates, making 3,400 plates, and this was about equal to the sum of the individual exhibits. These county displays were of deep interest, and showed to great advantage the horticultural possibilities of the various sections of the State. The application from California for 10,000 feet of space in which to exhibit the rare products of that most favored climate, led the management to assign to this collection the entire and separate hall originally intended for the Department of Printing and Journalism. This exhibit, which was shown the second and third weeks, was exceedingly attractive. It comprised the finest specimens of grapes, pears, peaches, plums, apples, quinces, oranges, lemons, olives, raisins, canned fruits, nuts and plants, showing the marvelous capabilities of the soil and climate of California. The combined exhibits of these two halls made up a display that in variety and excellence made this department one of the richest of the entire Exposition.

REPORT OF COMMISSIONER N. H. ALBAUGH.

TADMOR, O., December 1, 1888.

S. H. Hurst, Director General Ohio Centennial Exposition:

The exhibit in Horticulture at the Centennial Exposition of Ohio, at Columbus, was certainly the greatest show of fruit exhibited in the State, or, indeed, in the Mississippi Valley. It occupied a building 200 by 120 feet, and covered 14,000 square feet of ground, exclusive of the passage ways. Upon this space was placed tables, shelves and stands, of all artistic shapes, in squares, in cones, in octagons, in pyramids, and various other forms, thus occupying really nearly double the actual floor space, and giving to the visitor at one view a perfect landscape of rich and luscious fruits.

There were at least 800 separate and distinct varieties of fruits shown, which formed a school for the horticulturist in his calling—afforded but once in a lifetime. The individual exhibits occupied the center of the hall from end to end, and on the sides of the hall were placed the county exhibits.

In the county shows a space of 15x20 feet was allowed to each county, upon which they were allowed to build and decorate to suit their individual fancies. No two exhibits were arranged alike, and the variety thus secured formed one of the artistic beauties of the whole display—in fact, without these county exhibits, the department would have been shorn of much of its splendor. The following counties made exhibits, namely: Ross, Miami, Franklin, Lucas, Van Wert, Marion, Clarke, Lake, Montgomery, Ottawa, Belmont, Wayne, Morgan, Lorain, Wood, Stark and Muskingum, seventeen in all. Some of these counties are especially fruit counties, while others, though not given up largely to fruit-growing, nevertheless strove might and main to make a fine show, and they all succeeded. By a wise arrangement of the Board, there were three awards had in all the exhibits, giving the greater opportunity for competition to secure a share of the premiums. The following counties secured premiums, viz.: Ross, Clarke, Lake, Montgomery, Ottawa, Wood and Muskingum.

Industrial premiums were so numerous that there is not space to enumerate them.

The year 1888 was a special fruit year in Ohio, and right well did the horticulturists pour her products in Pomona's lap.

The courteous and gentlemanly superintendents of this department were constantly alert to give attention and impart information to visitors, and no one could spend an hour in the great fruit hall without feeling both instructed and delighted. The great Exposition has come and gone, but has surely left an impress in horticulture that will be felt, and its influence seen in the horticultural products of this great State for a generation to come.

Respectfully,

N. H. ALBAUGH,
Commissioner of Horticulture.

DEPARTMENT OF AGRICULTURE.

Naturally, in a State so famed for its agricultural wealth as Ohio, a large and interesting display in this department would be expected. A special effort had been made to secure collective county exhibits, a thousand dollars, in four premiums, having been offered, and many local county societies having been appealed to for this purpose. The large hall, with its 36,000 square feet of space, was beautifully decorated with columns and pillars of corn and other grain, and the display of agricultural products was entirely worthy of the State. The county exhibits were especially fine, and were arranged with great taste and skill. Grains, grasses and vegetables in vast abundance and variety, together with textiles, dairy, apiary and maple products, were built into all tasteful forms, until the entire hall was a picture of agricultural wealth and beauty. Individual displays were not so numerous as might have been expected, and somewhat of the space allotted to these was unoccupied. But the seventeen county displays from Ohio, two from Kansas, and the exhibits from the Ohio Experiment Station, and of noted seedsmen, made up a vast aggregation of exhibits, and fittingly showed the wealth, variety and excellence of our modern agriculture.

COMMISSIONER'S REPORT.

Hon. S. H. Hurst, Director General:

DEAR SIR: I have the honor herewith to submit to you a report of the Agricultural department of the Ohio Centennial Exposition.

The decision of the Board of Directors to offer premiums for collective displays of agricultural products, by counties, was a very fortunate one. Seventeen counties responded to the call and entered the contest, and in the aggregate made such a display of the products of the farm as had never been seen before on the American continent. These counties were Van Wert, Union, Licking, Lorain, Stark, Hamilton, Lake, Ross, Marion, Wood, Madison, Montgomery, Belmont, Franklin, Wayne and Clarke.

Each of these county exhibits was collected with great labor and expense, and their arrangement in Agricultural Hall displayed great taste and ability on the part of the exhibitors. The committee of gentlemen chosen to make the awards had a difficult undertaking before them. They spent three days in the work of arranging a plan and making the examination, and awarding the premiums.

The attractions of Agricultural Hall, as well as the instructions imparted to the visitors, were greatly enhanced by a display made by Mr. William Whiteley, Sr., of Springfield, Ohio, consisting of historic and pre-historic farm implements and household utensils used in log-cabins of the pioneer fathers. This collection, illustrating the history of the by-gone days, and especially the equipment of the farms and homes of Ohio during the first half of the past century, attracted the delighted attention of the visitors to this hall.

The Ohio Agricultural Experiment Station was allotted a space in which to make a display of the work being done by it. The display of grains, as well as that of the entomological charts and machinery for destroying the insect pests of the farm, were very fine, and attracted great attention. They were a source of much instruction to farmers and others who visited the hall. A. W. Livingston's Sons, of Columbus, made a display of grains, vegetables, grasses, etc., that added very materially to the appearance of our hall.

Cowley county and Logan county, of Kansas, each had a fine display of the agricultural products of their respective counties on exhibition. These displays very emphatically illustrated what an Ohio man can do when he puts himself to work in Kansas. I have been assisted in the work of my commission by Mr. A. R. Merrick, of Van Wert, and I assure you I am under many obligations to him for his efficient service, and in this connection I wish to record my high appreciation of the conduct and character of the ladies and gentlemen who had charge of the various exhibits in Agricultural Hall.

The farmers of Ohio are greatly indebted to these women and men for the illustration they have given of the wonderful possibilities of Ohio agriculture. And now with high appreciation of the favor and consideration shown by yourself, and all with whom I came in business contact in my official labors, I subscribe myself,

Yours, very truly,

S. H. ELLIS,
Com. Ag. Dep. Ohio Centennial.

DEPARTMENT OF FLORICULTURE.

This department was under the management of a commissioner, who, as a professional landscape gardener, had laid out the Centennial grounds and expended much labor in beautifying them. The organization of this department was, therefore, but the continuance and completion of this work of beautifying, and culminated in the splendid picture of Floral Hall. Here trees and shrubs, and vines, and native and tropical plants, and flowers of every kind, were grouped and platted with such taste and skill as to make up one grand picture of floral and tropical beauty, rarely, if ever, equaled in this western country. The floral display at various points on the grounds outside the hall was also most attractive, and, altogether, the department added immensely to the beauty and charm of the Exposition.

REPORT OF COMMISSIONER H. HAERLIN.

S. H. Hurst, Director General Ohio Centennial at Columbus:

As a review of the Floral Department of the past Ohio Centennial, I have the honor to report: Floricultural Hall, situated east of the Agricultural building, and approached by tan-bark avenues from south and east, embracing lawns with ribbon and foliage beds, choice hardy plants, tropical and succulent plants, also rustic-houses, seats, and model pioneer house, were distributed over the lawns and adjoining the building. The inside was gaily decorated; curving walks edged with sod, showed groups of plants to best advantage.

The Greenhouse Annex, heated by a hot water apparatus, and shown by J. Potts, of Columbus, answered for the class of plants that were most tender and had to be kept near the light. A large tank lined with foliage plants showed a rare collection of tropical Water-lilies; also several leaves of the Victoria Regia, the Brazilian Water-lily each leaf being five feet in diameter, sent by Mr. Buck, of the National Military Home, at Dayton; the Egyptian Lotus and Paper Plant, all being represented in this collection of aquatics.

Wm. Smith, Esq., Superintendent of Botanic Garden at Washington, D. C., sent a nice collection of carnivorous plants and pitcher plants, which hung around a large cherry tree, with some orchids, in the middle of the building. The largest oval in the center of the building was filled with large plants. Bananas, some in bearing, Philadendrons in fruit, Anthuriums, Dracanas, and a large and choice collection of plants from the Asylum for the Insane, represented by Charles Pullinger, gardener, as also richly-grown specimens of fancy caladiums and miscellaneous plants covered the staging of the conservatory and lined the edge of the basin. The merit for this fine collection deserves special mention, as, being from a State Institution, they were excluded from competition. The entire western side of the hall, as well as conservatory, was occupied by the great collection of Mr. Evans, of Columbus, and rewarded by first premiums as follows:

Best collection of plants and best arranged.

Best single plant, best collection of palms.

Best specimen palm finest leafarthis.

Best dracanas, best anthuriums.

Best crotons, best ferns and lycopodiums.

Best glaxinia, best collection of new plants, best roses, best hanging baskets and rustic stand. A finer display than Mr. Evans had has probably never been shown.

Mrs. W. Suder, of Toledo, received second premium on collection of plants and arrangement, also cornations, roses, tuberose and begonias.

Mr. Brehmer, of Chillicothe, was awarded premiums on leaf begonias, cannas, geraniums, fuschias, and hardy grasses.

Mr. Bruce, of Worthington, on coleus.

Mrs. Pullinger on asters.

There were many worthy contributions. Fine pomegranates, a fine collection of succulents, and cactus; also, miscellaneous collection in the amateur list of Wm. Ingman, of Marysville; fine bracket and rustic work—a miniature garden with fountain—by Mr. Roth, of the Ohio State University.

The first premiums were taken for great floral designs, cut-flowers, bouquets, etc., at the days set, every Wednesday during Centennial exhibition.

Mr. Evans, four successive Wednesdays, first premium. Mrs. J. Underwood, September 19, Mrs. Suder, of Toledo, Mr. Brehmer, Chillicothe, Mr. Breese, of Zanesville, Mr. Underwood, of Columbus, and others, were rewarded by premiums for designs and cut flowers. The floral days were always remarkable for the large crowds of visitors, and the attractions seemed to be highly enjoyed by the public, and many questions for information show how much this department was of interest and appreciation. Thank-

ing you and the secretary for the aid and courtesies, which enabled me to make my department a perfect success, I am,

Yours respectfully,

HERMAN HAERLIN.

At the closing of our Centennial exhibition, I take leave to reiterate the most meritorious exhibits in my department of Forestry and Floriculture. The forestry department, located in the southeast part of the Centennial Park, was connected by a rustic bridge over the east chain of lakes, and had in its center a neat log-cabin, vine-covered, and protected by wide rustic trellis verandas, under which a large collection of longitudinal and horizontal cuts of timbers, showing fibre and grain for mechanical purposes, and produce of forests, as lichens, mosses, fungi, wild plants, insects of forests, and some of their nests and habitations; also, of animal life, reptiles, turtles, etc. Odd and miraculous growth of trunks of trees; also, herbariums representing large collections of herbs, trees and shrubs of our forests, in well preserved dried specimens, classified, and neatly arranged on white paper.

The largest collection, over 300 species, Miss Emma J. Carl, New-London, is especially credited with best herbarium. For collection of woods Mr. Frank, of Oak Harbor, Ottawa county, exhibited a well arranged collection of 72 varieties of our forests, neat blocks, showing bark and grain of wood, arranged and labeled; also, from same collection of fungi and lichens, peculiar forms of limbs and trunks of trees, and collection of insects.

Around the log-cabin were the live specimens indigenous to our climate. Trees and shrubs planted in nursery style, of which Mr. Thomas Mehan, of Germantown, Pennsylvania, had the finest collection ever shown. A nursery of 850 different ornamental trees and shrubs, deciduous, and evergreen and hardy climbers, all doing well, and showing their rich contrasts in foliage and habitus, giving the interested public great object lessons, by comparison and study. The medal awarded by the judges for this celebrated collection, was only a small tribute for such a costly exhibit.

Adjoining the Thomas Mehan lot were the nurseries of Mr. Post, of Columbus, represented by the collection of fruit trees of very fine growth, and in best condition; also a collection of evergreen trees and shrubs, which made a fine display. Mr. Albaugh, of Tadmor, was also represented by a nice collection of evergreens, which reflected fairly on the nursery of Tadmor.

Not strictly confined to the Forestry Department, Mr. Livingston, of Columbus, exhibited a large patch of diverse vegetation. Another great attraction was an exhibit by the Michigan Carbon Works, who enriched a plat of ground by their fertilizer, and produced a variety of patches covered with cotton, tobacco, buckwheat, corn, millet, trees and shrubery, which greatly attracted attention.

The Forestry Department laid rather distant, but interested very many visitors, who took pleasure to study the many objects on exhibition, and as the place had been so attractive and full of instruction to the public, I would like to recommend herewith the maintenance of the same space for future exhibitions with the contributions of the diverse nurseries planted, it would, with little cost, be a great attraction.

Respectfully,

H. HAERLIN,
Commissioner of Forestry.

DEPARTMENT OF LIVE STOCK.

The accommodations at the Centennial grounds for the Live Stock Department were complete, ample and excellent; stabling for a thousand head of horses and cattle, and six hundred head of swine and sheep, had been provided. Liberal premiums had been offered in all classes and in all breeds of live stock, aggregating in the entire department over \$22,000. We were embarrassed, however, by the wishes and engagements of breeders of fine stock to visit other exhibitions, and found it difficult to retain them even two weeks at the Centennial exhibition. Nevertheless, in most lines the show was entirely creditable; and illustrated, very happily indeed, the wonderful advance that has been made in the improvement of the live stock of our own and surrounding States. One disappointment, however, should be noted. Our management had planned a sub-department of the Dairy, with the idea of making a test of the milk, butter and cheese-producing capabilities of the various dairy breeds of cattle. We had been encouraged to do this by the representations of these various dairy interests. We had made large expenditures in building a dairy and dairy barn, and offered nearly a thousand dollars in premiums for the best results in this great dairy test, but just at the last the contestants weakened, and not an entry was made. Thus were we induced to make a large outlay in this sub-department, and then were abandoned by the men and the breeders' associations, for which mainly the expenditure was incurred. The exhibition of thoroughbred and standard-bred horses in the speed-ring was an important feature of this department. To the general public the speed-ring is always especially attractive, and the production and improvement of these highest types of animals is undoubtedly an education in the right direction. Many of the very best horses in the Western States were here seen and admired, under the saddle or in harness. The Board is greatly indebted to the commissioner of this department, whose report is herewith submitted:

REPORT OF COMMISSIONER L. G. DELANO.

General S. H. Hurst, Director General Ohio Centennial:

I most respectfully submit the following report of the Live Stock exhibit at the Ohio Centennial. To enable exhibitors and their stock to attend other exhibitions, also to provide ample accommodations for them on the Centennial grounds, and to secure a large attendance of noted animals and herds, each class was assigned two weeks time for exhibition.

HORSES.

The Horse Department was ably conducted by Major Thomas McConnell, of Urbana, Ohio. Thoroughbreds—Novelty and running races occupied the first and second week, September 4 to the 15th. The Thoroughbred class was made up mostly with animals in their racing form. The racing was first-class; all were closely contested in fast time.

Draft, coach, saddle and matched horses, equestrian exhibitions, ponies and pony races were assigned the third week, September 17 to 22, and was the most attractive week of the exhibit. The display of draft and coach horses was never excelled in the United States; standard bred, roadsters, road and light-harness horses.

Trotting and pacing races occupied the fourth week, September 24 to 29, the various classes filled with high-bred, attractive and noted animals. The racing was a success in number of entries, character and speed of the horses, the close finish of all heats, numbers in attendance, good order of the audience, and in giving universal satisfaction to exhibitors and spectators.

CATTLE.

This department was in charge of James Buckingham, of Zanesville. The large, comfortable amphitheater, delightful music, and prompt management of the superintendent, made this a favorite resort for visitors.

All recognized beef breeds occupied the first and second weeks, and all dairy breeds the third and fourth weeks. Excellent exhibits were made by all the classes. It is due the American Hereford Cattle Association, and Hereford breeders, to make especial mention of the grand exhibit made by them. Competent judges pronounced it the best exhibit of Herefords made in this country. The Ayrshire breeders made the largest and best exhibit of the dairy breeds.

SHEEP.

Sheep were exhibited during the first and second weeks. W. N. Cowden, of Quaker City, Ohio, superintendent, conducted this department in the most satisfactory manner. The accommodations were ample and convenient, the exhibit extensive, full and meritorious.

SWINE.

Swine occupied the third and fourth weeks, W. B. Wallace, Oxford, Ohio, superintendent. The classes were large in number and superior in quality. The various breeds exhibited were as near perfection as it is possible for a hog to be.

POULTRY, PIGEONS AND PET STOCK.

The exhibit of poultry, pigeons and pet-stock, made during the second, third and fourth weeks, under the excellent and almost exclusive management of H. A. Bridge, of Columbus, Ohio, was a complete success. In quality and number of birds, it surpasses all previous exhibits.

The complete and convenient quarters for stock, the commodious grand stand and amphitheatre for guests—in fact, all arrangements for comfort of exhibitors and visitors were complete and highly commended by these. The judges selected by the Board of Directors proved to be men of experience and good judgment; their awards were just and satisfactory. The superintendents of the various departments were men of much experience, and were well qualified for the work. To their management, and the efficient aid of Secretaries Bonham and Fleming, also Captain W. S. Foster, is greatly due the success of the Live Stock Exhibit.

L. G. DELANO,
Commissioner Live Stock Department.

CHILLICOTHE, OHIO, November 14, 1888.

DEPARTMENT OF MINING AND METALLURGY.

In this department the management of the Exposition had hoped to show, first, all the crude metals, minerals and ores within the State, and many of their more crude products; and, second, all the precious metals and stones, and rare metals that could be collected. The latter, of course, could only be had from the private cabinets of collectors, or from the cabinets of public institutions where they are highly prized and closely guarded. It was found to be impracticable to secure a large exhibit of this character, and hence the Commissioner devoted his efforts to securing a representative exhibit of the metallurgy and mineralogy of Ohio.

The mineral regions of the Hocking, Muskingum, Scioto and Mahoning valleys—in fact, all the counties in the State specially known as mineral counties—were earnestly solicited to make representative exhibits of their mineral resources. Many county associations that promised exhibits, however, failed at the last to present them. Hence, the display in this department was not so great as the Board had been led to anticipate. Nevertheless, there was an interesting display of building stone, pressed, glazed and fire brick, tiling, sewer pipe, water mains, terra cotta, crude iron and iron ores, coal, coke, salt and lime, and a fine exhibit of the iron ores and general mineral wealth of the State of Tennessee.

DEPARTMENT OF MECHANICS AND MACHINERY.

Power Hall, the center of the machinery display, equipped with a new and powerful engine and extensive shafting, was fully prepared for the vast machinery exhibit brought together here. A number of new buildings were added to those already grouped around Power Hall, in which the large manufacturing establishments made special displays of their machinery.

Much of the agricultural machinery, engines, threshers, hullers, mills, etc., was grouped in the northwestern section of the grounds, quite a distance from Power Hall, where the smoke and noise would be less objectionable. The vast display of machinery exhibited in motion in and around the hall was a source of unflinching interest to the throngs of visitors, and illustrated as fully as in any other department the wonderful advancement of the past one hundred years. And especially did it emphasize the wonderful achievements of the inventive genius of the American people. The Commissioner of this department found himself unable, by reason of other engagements, to give his attention to its organization, and

hence the work largely devolved on the Superintendent, Mr. N. P. Mix, who assumed the responsible work and carried it forward to success.

REPORT OF SUPERINTENDENT N. P. MIX.

Gen. S. H. Hurst, Director General, Ohio Centennial:

DEAR SIR: In response to your request, in the absence of Mr. I. D. Smead, Commissioner of the Ninth Department, I submit the following report:

The work of soliciting exhibits for this department was commenced about July 1st, by issuing a circular letter to some hundreds of manufacturers, in all branches of mechanical industry. On July 9th, under the direction of the Executive Committee, I took a short trip, visiting manufacturers in Wheeling, Pittsburgh, Youngstown, Alliance, Akron, Cleveland and Wooster. The result of this trip did not seem to justify further outlay in this direction.

By this time prospective exhibitors began asking for space, which seemed to justify the conclusion that this department would be occupied fully. In this we were not disappointed. In the meantime the work on the great engine to run the two long lines of shafting, extending from end to end on each side of power hall, was progressing favorably.

There were no delays nor disappointments, and the opening day found everything in perfect readiness for the hand that set the engine in motion, which in turn set revolving hundreds of machines in almost endless variety.

The exhibitors vied with each other in getting their exhibits into the most attractive condition.

The space allotted to this department was almost entirely filled. The display was unprecedented. With these facts before us we must be excused from pointing out *special* merit, as you requested us to do. Scarcely a ripple of difference existed between exhibitors and the management, from first to last, and closing day found us loth to say "good by" to the host of genial exhibitors, whom we now call friends.

Respectfully submitted.

A. P. MIX,
Superintendent.

DEPARTMENT OF MANUFACTURES.

The Department of Manufactures necessarily included a wide field of exhibits, and had it been understood to cover the whole line of manufactured goods, it would have occupied much of the ground belonging to the department of merchandise.

Inevitably these two departments blended into each other, and the dividing line between them was necessarily a mere arbitrary one. This arbitrary division occurred in the south end of merchants' hall, where many exhibits were placed, that might with equal propriety have been classed in either department.

Mainly, however, this department was intended to cover the two large lines of exhibits, which included carriages of every kind, and stoves and heaters of every possible description. The exhibits of these two lines of

manufactures was made in carriage hall, which was compactly filled with an elegant and wonderful display. Especially was the show of carriages and pleasure vehicles fine beyond comparison with any such display ever seen in the west. Many visitors, and notably the leading members of the National Carriage Makers' Association, pronounced this the finest display of carriages ever made in this country, with the single exception of the Philadelphia Exposition in 1876.

REPORT OF COMMISSIONER J. J. SULLIVAN.

The tenth department—that of manufactures—was a grand success in quantity, quality and attractiveness. It was regarded by many as one of the most attractive and entertaining departments in the Ohio Centennial.

In this department were exhibited carriages, buggies and other pleasure vehicles, stoves, ranges, heaters, worked metals, marbleizing, plumbers' goods, household implements, woodenware, builders' supplies, saddlery, harness and hardware.

The Columbus Buggy Company, which claims to be the largest buggy factory in the world, made a grand and magnificent display, exhibiting an endless line and variety of carriages and pleasure vehicles, and occupying one-fourth of the space in Carriage Hall. Side by side with these beautiful vehicles were exhibited the carriages of LaFayette and Jackson, in which those distinguished men rode a century ago. Another feature of their exhibit, which attracted much attention, and, exhibited as they were, illustrating the progress of many years, was an ox-cart and plow two hundred years old, the latter consisting simply of a one-handled stick, which rooted up the ground a little on top.

The Buckeye Buggy Company made a beautiful display of carriages, and to make the contrast more marked, bringing out the beauty, grace and elegance of their vehicles of to-day, they had on exhibition, in the midst of their display, the carriage of Washington, the Father of our Country.

The Troy Buggy Company made a very creditable display of their specialty in surreys.

The Ohio Buggy Company, just recently organized at Columbus, is deserving of high praise for their elegant display. In quality and style they were not to be outdone, and their workmanship was of the highest order.

Shaw & Hayward, of Beverly, showed several vehicles, for the purpose of exhibiting their patent tension spring. In their display was a wagon without axles or fifth wheel, and the particular construction of their vehicles attracted considerable attention.

There were a number of other firms which assisted in making the Carriage Department full and complete, viz.: The Collins Manufacturing Co., Miller, of Delaware, Bradley, Holton & Co., Scioto Buggy Co., etc.

It was the consensus of opinion that the carriage exhibit at the Ohio Centennial was the finest ever made in Ohio.

S. K. Bradshaw made the only exhibit of stoves that we had, yet it was of such magnitude as to make up for lack of number of exhibitors. P. Hayden & Sons made an extensive exhibit of the Morley Furnace, which they manufacture, and in connection with which they displayed one of the finest collection of registers. G. Schreyer showed his cast-iron, hot-air, smoke-consuming furnace, which he manufactures, together with his patent steel thimble-skein. The Vogelgesang Furnance Company, with a splendid assortment of registers and a variety of their wrought-iron furnaces, so arranged their display as to readily exhibit the principle upon which they operated, and at the same time present an attractive appearance, was there to take second place for no one. J. H. & F. A. Sells, manufacturers and wholesale dealers in harness and saddlery, spared

no pains or expense to make their exhibit one of the best in magnitude and grandeur. It was far beyond anything in this line ever seen at Columbus. E. N. Hatcher, manufacturer of thimble-skeins, boiler-fronts, and architectural iron work for buildings, notwithstanding his products were of such a character as to make it difficult to arrange a display of them so as to be attractive, nevertheless had an exhibit that was of some interest to all, and especially attractive to many. Isaac B. Pottshad a full and complete line of plumbers' goods on exhibition in his own building, constructed especially for the display of plumbers' goods and wares.

Respectfully,

J. J. SULLIVAN,
Commissioner 10th Department.

DEPARTMENT OF MERCHANDISE.

In the extensive department of merchandise a great variety of exhibits was displayed. The lower story of the main central building and the hall of merchandise proper, unitedly containing a floor space of 35,000 square feet, were compactly filled with interesting displays. The suites of rooms in the central building, furnished and decorated by the combined enterprise of a number of business firms of Columbus, were made elegant and beautiful regardless of cost. The mantels, floors, grates, heaters, carpets, curtains, furniture, upholstery, chandeliers, fixtures, pictures and ceiling and wall decorations were the most elegant that modern art has produced, and as models of elegance, luxury and taste, they were studied and admired by many thousands. The active exhibits, operated by electrical power, in the hall of this department, the coffee-packing machine from Wickel & Smith Spice Co., of Philadelphia, Pa., the silk looms of Henry Mitchell, of Brooklyn, N. Y., and the pin manufactory from Birmingham, Ala., were of special and attractive interest.

In general, the exhibits of this department were not a mere show of dry goods, but a display of a vast variety of things useful and beautiful, and they were representative of all possible lines of mercantile wealth.

REPORT OF COMMISSIONER W. M. BAYNE.

CLEVELAND, O., January 1, 1888.

Gen. S. H. Hurst, Director General, Ohio Centennial:

DEAR SIR: At your request, I send you a few things with reference to the Department of Merchandise at the Ohio Centennial.

On the day of opening, our department was fully abreast of the other departments in display, and was able to present a creditable showing. Though incident to all great exhibitions of this kind more or less delay is caused by exhibitors not having their goods in shape in time, this department was as free from this annoyance as any of the other departments. We occupied the lower part of the main central building and the south annex. Every available space was occupied with as fine a display as was ever seen in Ohio, and did great credit to the State. Space and time will not permit of a personal

mention of all exhibits, but I cannot pass by some of the firms represented without saying a word in commendation of their enterprise and taste. First, that of Eldridge & Higgins, of Columbus, Ohio. Their display of wholesale groceries, canned goods, etc., was undoubtedly the finest show on the grounds. The exhibit of the Standard Sewing Machine Co., of Cleveland, Ohio, was such as any firm might be proud of. The crowds that visited it from day to day testified as to its worth as an exhibit. The firms of Bowe & Beggs, Krauss and Meehan, Butler & Steuerwald, wholesale carpet dealers, of Columbus, Ohio, deserve the highest praise. The Willimantic Linen Co., of Connecticut, displayed a fine lot of manufactured goods, which drew the attention of thousands of visitors. The A. B. Chase Co., of Norwalk, Ohio, manufacturers of pianos and organs, exhibited a fine display of instruments, which were commended by all who were so fortunate as to see them. Also, W. H. Grubbs and G. W. Early, of Columbus, Ohio, had a fine showing in pianos.

The furniture show of the Ohio Furniture Co., Freeman, Halm & McAllister, Columbus Cabinet Co., Val Loewer and the Delaware Chair Co., were such as to call forth the admiration of the visiting populace. The firms of Riddle, Graff & Co., of Delaware, O., Geneva Tool Co., Geneva, O., the Buckeye Glass Co. and Harthwood Glass Co., of Martin's Ferry, Ohio, the Central Ohio Paper Co., Batterson and Hensel, E. O. Randall & Co., Hasbrook, Orr & Byers, Iron Phosphate Co., Johnson & Co., Kinnear & Co., Snow & Dill, Simons Bros., Hammond & Abbott, Kelley & Co., of Columbus, O., J. L. Prescott, of Maine, the Home Co., of Akron, Dillon Soap Co., of Zanesville, O., are all entitled to the highest praise for their elegant displays.

Last, but not least, was the Smyser automatic packing and filling machine, of Philadelphia, Pa., and the energy displayed by the Ohio Coffee and Spice Co., of Columbus, in exhibiting it in actual operation to the visiting public, was most marked. Great crowds thronged the building every day to witness the working of this most wonderful piece of mechanism. Space will not permit a personal mention of all firms exhibiting in this department. But as a whole the department of merchandise, I think, was fully up to the most sanguine expectations, and each exhibiter did all that could have been done to make the great Centennial a success.

In conclusion I desire to express my sincere thanks to Director General S. H. Hurst, Secretary Bonham, and his corps of assistants, also to Mr. Frank Breyfogle, the Superintendent, for their uniform kindness and assistance in carrying forward the great enterprise.

Very respectfully,

W. M. BAYNE,
Commissioner Dep't of Merchandise.

DEPARTMENT OF COMMERCE AND TRANSPORTATION.

The hall of this department, and the lake so near it, afforded opportunity to exhibit many things that were old and curious, showing the methods of travel and transportation by land and water in pioneer times. And no contrast could be more marked than that which is shown by the old and new in this department. Some of the most interesting things that might have been shown here, however, could only be secured by a large outlay of money, and the limited means at the command of this department necessarily limited the display. The pioneer log-cart, the old Pennsylvania wagon, the old-time stage-coach, the North Carolina

"Dandy," and the universal "dug-out" were, however, fit types of these earlier methods, and the first crude and clumsy locomotive engines contrasted wonderfully with the skillful achievements of these latter days. The following is

COMMISSIONER HAMILTON'S REPORT.

COLUMBUS, O., December 27, 1888.

Gen. S. H. Hurst, Director General, Ohio Centennial:

SIR: I have the honor to report that at your request I took charge of the department of commerce and transportation at the Ohio Centennial, and undertook to procure from the different sections of the State such articles as would best illustrate the advance in the mode of conveyance, both public and private, during the past century. In this I was reasonably successful, although, from the lack of veneration peculiar to the young and practical state, the people are careless about preserving anything when it has been superseded by a contrivance better adapted to the public need.

The department was crippled, by the lack of funds, in making a thorough canvass of the State, and in securing many articles of interest, which might have been secured had we been able to offer any pecuniary inducement; and we were compelled to rely upon the private enterprise of rival firms of bringing and taking care of the historical coaches which properly belonged to this department, and which contributed so much to the general interest.

Notwithstanding this, we were enabled to place upon exhibition many articles of deep interest, peculiar to a bygone age, which revived fond memories in the breasts of the old, and aroused curious inquiries in the minds of the young.

The "Historical Pageant," on the Centennial grounds, organized by the department for "Columbus Day," October 9, was one of the most remarkable attractions of the Exposition, and vividly illustrated the different stages of progress during the past one hundred years, showing Indian life, with costumes, weapons, and "pony-drags" for the sick, the coming of the hunter and trapper, with their horses and pack-saddles, the emigrant, with his family and outfit, followed by the ox-wagon of the early settler, the Conestoga wagon of the early trader, the stage-coach of the early traveler, including a model locomotive engine of the present day, together with the different styles of water-craft, from the Indian birch-bark canoe to the latest style of steam-boat and sailing yacht, the whole procession forming an object lesson to the gathered thousands as instructive as it was novel and attractive.

W. D. HAMILTON,
Commissioner.

DEPARTMENT OF PRINTING AND JOURNALISM.

It was the purpose and hope of the Centennial Board to show the successive steps of advancement in this department during the entire century; to place alongside of the splendid power presses of to-day the printing-presses of 25, 50, 75 and 100 years ago. Our chosen commissioner, Mr. R. B. Brown, of Zanesville, visited the departments at Washington, and found in them many models of printing-presses and other curious things pertaining to the printer's art. He also found all the latest inven-

tions and improvements, showing the marvelous advancement made during the century.

With the material that could have been collected from private sources, and the loan of the models in the Departments at Washington (of which loan we had favorable assurances), we had planned the equipment of a most interesting department of the Exposition, such as never before had been organized in any American Exposition. But at the very last Congress refused to permit the loan, and we were necessarily limited to the less interesting private exhibits.

It was found upon estimate that such an exhibition would not only be very costly, but also very limited and imperfect, and, in view of these facts, it was determined to abandon the organization of this department.

Commissioner Brown was thereupon assigned to duty in charge of the press, and devoted himself most faithfully and efficiently to the welcome and entertainment of its representatives, and to its reportorial work.

WOMAN'S DEPARTMENT.

The constantly widening realm of woman's skillful work suggested the organization of a department entirely devoted to, and representative of this special, yet varied work of woman. And the wish of the State Board of Agriculture to invite the women of Ohio to a representation in the future annual industrial fairs of the State, determined the erection of a permanent building for this department. The decision arrived at, that the departments of art and floriculture should only include professional art and professional floriculture, and assigning amateur art, which is generally the work of woman, and amateur floriculture, which is always the work of woman, to this department, added greatly to the magnitude and interest of its display.

But the organization of this new department was a herculean task. The vast amount of correspondence and labor necessary in awakening the interest and enlisting the co-operation of the women of a hundred towns and cities, and of many rural districts, so that the work might be representative of the whole State, can scarcely be estimated. Only the administrative ability, indomitable purpose, and sublime patience of a woman grandly equipped could have accomplished the work. In securing the services of Mrs. Delia Lathrop Williams, of Delaware, Ohio, the Board was most fortunate, and for the excellence of her work in organizing and managing the department, they are under many obligations.

The following is her departmental report:

REPORT OF THE WOMAN'S DEPARTMENT.

Ladies in charge: Mrs. Delia L. Williams, Commissioner; Mrs. N. E. Lovejoy, Superintendent Domestic Department; Ella Grant Campbell, Superintendent Floral Department and Decorations; Mrs. Helen Olmstead, Superintendent Art Department; Miss M. E. Dean, Book-keeper; Miss Mattie Olmstead, General Assistant; Miss Anna V. Culbertson, Cooking Teacher; Mrs. Sarah Breyfogle, Saleswoman in Exchange.

A handsome permanent building, one hundred and fifty by ninety feet, with a gallery twenty-one feet broad entirely around it, was constructed for the Woman's Department of the Ohio Centennial. The Commissioner began work for the department early in the year, by opening correspondence with one or more representative women in each county, with the hope of inducing them to interest other ladies and so secure a County Centennial Association of ladies, whose duty it would be to see that a suitable county exhibit should be prepared and sent to Columbus.

Sixty-two counties were thus interested in preparations for the Centennial, and a large proportion of them made praiseworthy exhibits. The various county committees deserve great praise for the faithful and laborious part they bore in making the Centennial a success. They gave their services freely for the love of their State and pride in its growth and prosperity, and earned the grateful remembrance of all who have enjoyed the results of their work. Besides these county collections, a large number of individual exhibits were sent from counties not organized for combined work, so that as the result of this correspondence and the consequent distribution of information, not only nearly every county in the State was represented in the exhibition, but people were interested to go to Columbus to see the Centennial, about which so much was being said. It was the hope of the Commissioner to have every department of woman's work represented, by active employment where practicable, and by results where processes were impracticable. Thus would be shown to what extent occupations for women has multiplied in a century, and with what degree of excellence they were doing the work they had assumed.

The exhibits were accordingly classified into the professions of law, medicine, teaching, journalism and literature, including authorship, correspondence, essays, etc. The related arts of type-writing or stenography were not overlooked or forgotten. The department of benevolence included the work of retreats, asylums, industrial schools, and the Women's Relief Corps. The department of reform looked especially to the temperance work of women. There was also an art department, including pottery, molding, decorations and firing; painting in oil and water-colors, upon canvas and fabrics; wood-carving and wood inlaying, engraving upon wood and steel; photography and ornamental penmanship, as well as needle-work in its various forms and applications. The department of art industries included lace-making, dress-making and millinery; that of domestic work, plain sewing, patching, darning, machine stitching, knitting, crocheting, laundrying, fruit-canning and cooking. The arts of type-setting, printing, and taxidermy had their place, as well as the outside occupations of floriculture, horticulture, bee-keeping and silk-culture. The inventions of woman also had a space assigned to them. Added to all this, there was a department of pioneer things. Each county that organized, appointed its committees upon these various classes of woman's work, and brought to Columbus the results of their efforts. Several of the counties gave very successful county exhibits before forwarding their collections to the Centennial, notably Holmes, Lorain, Morgan and Champaign counties. Nearly every department of work referred to above was well represented at Columbus, and many of them by displays so large as to be with difficulty accommodated. All articles entered were booked under one of three heads, namely, for loan, for premium, or for sale. It was necessary to keep articles for sale in one part of the building, and those entered for premiums in another part, by themselves; and as the same kind or classes of articles were to be found in each of these general divisions, premium, sale and loan, there was a degree of repetition which would have been avoided if the entire exhibit had been a loan. The commissioners regretted the necessity for this

duplication of classes, which gave the appearance of lack of organization and sharp classification, but it seemed unavoidable. There are some features of the exhibit to which it seems proper to call especial attention. Notwithstanding a great deal of the best of woman's work in art was exhibited in the art building, there was in the art department of the woman's building one-hundred and fifty-five numbers, as per catalogue, in oil, water-color, pastel and crayon, besides several portfolios of excellent studies. Added to this was a display of china decoration, consisting of several hundred pieces, and a commendable exhibit of wood-carving and wood in-laying. This display was very much commended by visitors. A "book-corner," containing copies of books written by Ohio women, and the portraits of some of the most eminent Ohio authors among women, was a center of interest for visitors; and an alcove of old costumes displayed upon forms called forth, especially from the aged and the children, perpetual exclamations of surprise and delight. A department of girls' work was very much complimented, and some of it showed good proficiency in self-supporting occupations, thereby giving a patent proof that there are productive industries for girls, and that there is something better for them to do than to paint pictures and make crazy patchwork. A large woman's exchange served as the medium of exchange between women who put their handiwork on sale, and persons who wished to buy. Besides furnishing a practical illustration of this feature of woman's work, it was serviceable to both seller and buyer. The ancient kitchen, with its fireplace, crane, spit and settle, its dried herbs and old gun over the mantle-piece, its blue Delf in the "china cupboard," its splint-bottom chairs, and the old historic deal table, upon which was signed the infamous agreement between Blannerhassett and Burr, its "little wheel," "great wheel" and reel, upon which both flax and wool were spun and reeled, during the Exposition. This was a place where a crowd always lingered to discuss old times and the friends of other days. Many a man lifted his little one reverently, his own heart filled with thoughts of his mother, and said "your grandmother spun on a wheel like that." Many tears of tender recollection were shed at the rail of the old kitchen. In contrast with this was a beautiful suite of modern rooms, consisting of hall, drawing-room, dining-room, chamber and bath-room. The exquisite hand decorations of ceiling and walls, the genuine gobelin tapestry, the Turkish and Persian rugs, the hand-covered furniture and mantles, the inlaid floors, the service china, and the beautiful stationary toilet and bath arrangements, were a constant source of interest, as well as a means of education.

One of the most interesting features of the Woman's Department was the cooking school. This was so arranged that a class was at work under direction of a teacher of cooking from 10 A. M. till 3 P. M., for the entire forty days of the Exposition. During this interval a complete and choice dinner was prepared and served each day to from twenty to forty persons, in a little dining-room adjoining the cooking-school. Both the pupils who received instruction in cooking and the persons who availed themselves of the results as served in the dining-room, were unqualified in their commendations of the experiments. The ladies in charge of the Woman's Department have taken the liberty to commend the following exhibits to the attention of the Board, and to recommend that a silver medal be awarded for excellence:

1. To Mrs. Theo. J. Wormley for a display of steel engravings of poison crystals, several hundred in number. The drawings were made by Mrs. Wormley from objects under the magnifying glass, and were afterwards engraved by her. The engravings are marvels of fine work, and have been pronounced by critics equal to any corresponding work in Europe or America.

2. To Mrs. C. B. Stewart, of Portsmouth, for an exhibit of ninety pieces of pottery, modeled, decorated and fired, by herself.

3. To Mrs. G. W. Bannon, of Portsmouth, for a large exhibit of the birds of Scioto county, the product of her skill in taxidermy. The exhibit was not only very large, but was pronounced by skilled persons as very excellent work.

4. Mrs. Parr, of Newark, for a silk exhibit of her own production, consisting of cocoons, reeled silk and a variety of articles manufactured from the cocoon covers.

The Woman's Department is especially indebted to the Ohio Furniture Company for the loan of furniture necessary to the complete outfit of the department, in all seventy-five pieces. It is indebted to Messrs. Bowe & Beggs, and to Messrs. Steurwald & Butler, for the use of a large number of poles and rings, draperies, decorations and rugs, and to Messrs. Z. L. White & Company, and to Messrs. Souder & Bright, for the loan of dress and bonnet-frames.

The commissioner wishes to express her deep obligations to the ladies who worked up the various departments, as well as to her associates in charge, for their constant, earnest and intelligent co-operation in every effort to make the department a success. She would also make grateful mention of the invariable courtesy and kindness of the agents and employees of the various express companies doing business in Columbus.

Respectfully submitted.

DELIA L. WILLIAMS,
Commissioner Woman's Department.

DEPARTMENT OF PUBLIC SERVICE AND CHARITIES.

Ohio is acknowledged to be among the leading States of the Union, in building up a great system of charitable and reformatory institutions, and in caring for and educating her unfortunate wards. Her deaf, dumb, blind and insane, imbecile, feeble-minded, incorrigible and orphan youth have each and all the special guardianship of the State. The institutions and schools established for the care and education of these various classes, form a great system of the public service, which, though costly, is yet most creditable to the State, and to our advanced civilization.

The management of the Centennial Exposition deemed it of great importance to show the growth and perfection of this system during our first century, and for this purpose planned and organized this department.

The commissioner chosen to have charge of this work, was officially most familiar with all its details, and, but for the embarrassment caused by want of means, could, doubtless, have made the department exhibit far more attractive. With the means at command, however, the work of these schools and institutions was presented in a creditable manner, and the exhibit is fully outlined by the commissioner's report.

REPORT OF COMMISSIONER A. G. BYERS.

COLUMBUS, O., October 24, 1888.

To Gen. S. H. Hurst, Director General Ohio Centennial:

Having been honored by the Board of Centennial Directors, as Commissioner of Public Service and Charities, I began as early as practicable during the year, by correspondence and personal visitation of public institutions, to organize the department of public charities for exhibition during the Centennial, and in connection therewith I feel it due to the Board of Directors and to the several institutions contributing to the Centennial Exhibit, to submit the following report:

Apartments were assigned in the educational building by the Commissioner of the Educational Department, Rev. Dr. H. A. Thompson, whose courtesy is hereby acknowledged.

The various booths assigned were occupied as follows: The blind in a double booth tastefully arranged and decorated, in which their school apparatus—maps, books, methods of teaching, reading and writing, were exhibited, together with an extensive and beautiful display of kindergarten and other school work. In connection therewith there were also exhibited the results of domestic and artistic training, bead-work, embroidery, sewing, etc.

Opposite the blind, corresponding in space, was the exhibit of the institution for the education of the deaf and dumb.

The chief exhibit from this school were articles of chamber furniture made of black walnut, of substantial construction and fine finish, which would be creditable to the best cabinet making establishments of the State. There were a few books, indicating the educational progress of the pupils; case of hand-made shoes; and an exhibit of plain and artistic printing.

Adjoining the blind, also in a double booth, most artistically decorated, constituting one of the most attractive features of the entire Centennial, was the exhibit of the kindergarten work of the Franklin County Children's Home. Mr. and Mrs. A. S. White, superintendent and Matron, and Miss Ida Glover, the kindergarten teacher, are heartily commended to the consideration of the board as worthy of honorable mention. Opposite the Franklin county booth, a single booth with a display of photographs of county children's homes, as follows: Belmont, Franklin, Guernsey, Logan, Meigs, Morgan, Preble, Richland, Scioto, Tuscarawas and Warren counties. There were also photographs of Putnam, Madison and Erie county infirmaries.

This booth was also decorated with Kindergarten and fancy articles from the Fairmount Children's Home. In connection with this was the exhibit of the Scioto County Children's Home, of school work performed by the children in that institution. This was in a handsomely bound book, and it is doubtful if, for tasteful arrangement, neatness of execution, accuracy in map-drawing and general results, this work was surpassed by any exhibit in the educational department.

There was also a display of neatly executed drawing work, made by the little boys of cottage No. 3—Miss French, matron—of the Soldiers' and Sailors' Orphans' Home, at Xenia. In addition to the foregoing, there were also school examination papers, handsomely executed and conveniently bound, making a full exhibit of the different branches taught at the Home in Xenia.

A display of brooms and whisks from the Working Home of the Blind at Iberia. In the same booth there were two cases containing fine drawn work, fancy articles, crochet, knit and sewing, plain and fancy, done by the girls at the State Industrial School at Delaware—Col. J. M. Crawford and wife, superintendent and matron. This branch was especially attractive, and was highly complimented by visitors.

Next to this booth, also a single one, there was an extensive, elegant, and in many respects quite curious display of work done by patients in the Columbus and Toledo asylums for the insane, Dr. J. W. McMillen, superintendent of the former, and Mrs. McMillen, the matron, having taken special pains in this display. The same may be said of Dr. and Mrs. H. A. Tobey, superintendent and matron of the Toledo asylum.

The display from the Toledo asylum presented quite a variety of fancy and useful articles, the character and extent of which was quite remarkable, in view of the fact that the institution was not opened until January, 1888—nine months before the opening of the centennial.

Taking the display from both institutions, it may be said that it comprised nearly all the modern methods and designs of fancy work, useful and ornamental, with here and there something incongruous and queer, indicating mental incoherency.

There were singular devices of keys, knives, saws, and other articles, quite ingeniously contrived for purposes of escape.

This booth was decorated with large, well executed photographs of the Cleveland and Columbus asylums. Thanks are due to Dr. Jamin Strong, who for thirteen years has been the efficient Superintendent of the Cleveland asylum, for the former, and for the latter to Dr. J. W. McMillen. In connection with this display, which proved to be quite attractive to the visitors, whose constant expressions of surprise "that crazy people could do such work," it became necessary to explain misapprehensions in regard to the intelligence and skill of insane people, and furthermore, to indicate that it was not intended as a display of the kind of work performed by the insane, but the fact that *work* was given them to do, as against former methods of treatment, where they were closely confined, and kept in idleness, and how, by giving them employment, one by one mechanical and chemical restraints were removed, until now, throughout the State, very few of these restraints are needful.

A Utica bedstead or crib (formerly used for a brief period in the Columbus asylum), was exhibited as one of the forms of restraint employed in the treatment of the insane throughout the country during the last half century. These, as most of the milder forms of mechanical restraints, have been reduced to their minimum, and are now employed only under the supervision of medical officers, our State, under the experienced skill of Dr. Richard Gundry, formerly for many years superintendent of Ohio asylums, having pioneered this reform. Adjoining the exhibit of the insane, was the booth appropriated to the display of the institution for the education of the feeble-minded youth. The display of this institution was most elaborate, covering the methods of education employed and the results attained in the school department, mechanical and domestic work performed by pupils, with an almost endless variety of fancy work, artistically displayed, surrounding a large and elegant photograph exhibiting the institution in detail, the whole making a magnificent display of the institution and its work, reflecting great credit upon the management—Dr. S. A. Doren, Superintendent, Mrs. Doren, Miss Purple, matrons, and the officers and teachers of the institution, manifesting great interest in contributing to the success of the Centennial.

Opposite to this display was the exhibit of the Boys' Industrial Home, at Lancaster, a complete and exact model of the original log building, erected in 1857, with a large, elaborately constructed frame, containing photographs of all the modern buildings now in use. In connection with this exhibit were brushes and socks made by the boys as a part of the industry of the institution. The exhibit was highly creditable to the institution, and thanks are due to Mr. and Mrs. Charles Douglas, superintendent and matron.

The final exhibit in this department was that of the county jail, the primitive, as compared with the modern style of jail architecture. The former was of logs, three thicknesses, two horizontal and one perpendicular, being, possibly, the strongest jail ever constructed. The Madison jail was exhibited, in plans drawn by J. W. Yost, of Columbus, the architect of the Licking county jail, the last building of the kind contracted for in the State. This building is after the general plan recommended by the Board of State Charities, and originally designed by one of its members, the late Joseph Perkins, of Cleveland. Here, as in many other departments of reform, Ohio may claim precedence. The "Ohio plan of jail" is now favorably known throughout the country, and favorably regarded. Mr. Perkins devoted time, money, extended travel and observation to the interests of prison reform, and to this, as in numberless other reforms, as well as his general benevolence, the State is indebted for the advanced position as leading in educational work, social and moral reforms, and in the extent, exalted character, and efficient organization and management of her benevolent institutions.

In connection with the foregoing exhibits, in accordance with request of printed circulars addressed to the different superintendents, educational work was further displayed by the Franklin County Children's Home, and the State institutions for the Deaf

and Dumb, and Feeble-minded Youth, the large and well trained band from the latter institution contributing, on several occasions, to the entertainment of visitors.

It is due to Col. Miller, Superintendent of the Institution of the Blind, to say that from the beginning he manifested great interest in the general display of the public charities, and was ready, at any time after the opening of the school, to give an exhibition of school work of that institution, and it is a matter of regret that the orchestra, choir, and educational methods were not afforded an opportunity for exhibiting their work. A programme arranged, in consultation with Mr. H. T. Chittenden, Vice-President of the Board, for the exhibition of the three institutions, the band of the Feeble-minded, the choir of the Blind, a class in pantomime from the Deaf and Dumb, was arranged, but the use of the Coliseum could not be had on the day appointed.

Respectfully submitted.

A. G. BYERS, *Commissioner.*

MORGAN'S GREAT PICTURE.

In connection with the art department, and in an adjoining building erected for the purpose, the Columbus Gallery of Fine Arts had on exhibition that great work of Matthew Morgan, "Christ Entering Jerusalem," and in addition a pictorial effect of the Crucifixion, by the same great artist, in which that sublime tragedy is accompanied by the semblance of an angry sky, with thunder and lightning most realistic. This masterpiece of art added to the unequaled display in art hall, and these, supplemented by the amateur art work in Woman's Department and central hall, made a rich feast indeed for the true lovers of art.

THE GREAT REUNION.

Many associations held their meeting at Columbus during the progress of the Exposition, but the most notable event connected or associated with the centennial Celebration was the holding at Columbus, during the second week of the Exposition, the National Encampment of the Grand Army of the Republic. Seventy thousand comrades of the Grand Army marched in the great procession, and more than 100,000 visitors witnessed the splendid pageant. It was much the most imposing and enthusiastic reunion of soldiers held in this country since the war, and the review was the most magnificent pageant seen since the grand review at Washington in 1865, when the armies of Grant and Sherman were welcomed home from the war. Many thousands of the comrades and visitors also visited the Exposition, and Old Army Day and Grand Army Day at the Centennial grounds were occasions of much interest.

PRIVILEGES.

To accommodate the thousands of exhibitors, employes and visitors at the Centennial the following privileges were sold :

Dining halls.
Log-cabin lunch rooms.
Lunch booths under grand stand.
Lunch booths under amphitheater.
Lunch stands on grounds.
Cigar stands.
Fruit stands.
Advertising.
Race score cards.
Barber shop.
Notion stands and bazaars.
Toy balloons.
Amusement privileges.
Ice cream, candy and pop corn.
Soda water, lemonade, etc.
Peanuts.
Revolving swing.
Photograph privilege.
Check room.
Centennial medals.

The sum received for these privileges amounted to \$15,985.

No games of chance, lotteries or other objectionable privileges were allowed, and no sale of intoxicating liquor was permitted on the grounds.

SUCCESS OF THE EXPOSITION.

As a celebration by the people of the State of the event and achievement it was intended to commemorate, the Centennial Exposition, with its imposing ceremonies and its vast display, was unquestionably a great success. It turned the attention of the people, and especially of the young, to the study of our wonderful history ; it cultivated respect and veneration for the pioneer fathers and mothers, who, with great privations and hardships, cut their way through the wilderness a hundred years ago, and laid here the foundations, and built here the industries of a civilized State ; it showed the marvelous advancement made by our people during the century in all the elements of intellectual and material wealth ; it brought to light the vastness and variety of our material resources ; it showed, as never before, the varied industries of our people in every section of the State, and beyond and above all these, it showed the pride of State and love of country that inspired the people of Ohio in thus cher-

ishing the memories of the past, and celebrating the achievements of the present in this great Centennial Jubilee.

STATEMENT SHOWING THE FINANCIAL TRANSACTIONS OF THE OHIO CENTENNIAL TO JANUARY 14, 1889.

The following statement, compiled from the journal and ledger record of itemized accounts, is a complete summary of the financial transactions, from the first expenditures up to January 14, 1889. All expenditures were by checks, or orders, on the Treasurer, signed by the Director General and Secretary :

RECEIPTS.

From Columbus citizens' subscription.....	\$23,020 00
" State appropriation made to State Board of Agriculture, but paid to and expended by the Centennial Board for buildings and improvements, as contemplated in the act.....	20,000 00
" Ohio State Board of Agriculture, being the proceeds of mortgage bonds, or notes, issued by said Board by authority of the General Assembly, and transferred to the Centennial Board for erection of buildings.....	50,000 00
" rent of rooms in King building	27 00
" sale of old office carpet.....	5 40
" sale of book-covers.....	2 10
" W. R. Kinnear & Co., in settlement of difference in quality of roofing, accepted in building, from that required in the specifications.....	200 00
" U. S. Express Co., for permanent lease of office room in Express building.....	187 50
" Adams Express Co., for permanent lease of office room in Express building.....	187 50
" American Express Co., for permanent lease of office room in Express building.....	187 50
" sale of 278 wood-bottom chairs.....	82 20
" sale of spoons and forks from Woman's Department... ..	6 00
" sale of two office rugs.....	5 00
" re-payment, by Wells & Tracy, on return of glass cases.....	40 41
" unexpended balance of bill-posting fund	3 04
" payment of bronze medal above premiums awarded.....	3 00
" sale of lumber and sash from temporary buildings.....	2,072 75
" sale of packing-chest.....	6 00
" sale of two reg. turn-stiles.....	60 00
" sale of single admission tickets.....	83,159 25
" sale of grand-stand tickets.....	1,884 00
" sale of R. R. coupon tickets.....	962 75
" sale of ex. and help tickets.....	2,113 50
" sale of privileges.....	15,985 71
" entry fees.....	11,242 00

From Woman's Department—	
Dining-room receipts.....	\$561 97
Sale of material	87 20
Percentage on sales in Woman's Exchange.....	15 00
Other mis. sources.....	23 25
	687 42
From cash surplus in Treasurer's account after crediting ticket sales and other receipts.....	270 21
Total receipts from all sources.....	\$212,400 24

DISBURSEMENTS.

For premiums.....	\$27,528 69
“ printing and advertising.....	15,578 84
“ labor and assistance.....	10,185 08
“ material and supplies.....	15,580 90
“ expense Department of History and Archaeology.....	1,813 24
“ expense Department of Science and Education.....	1,209 90
“ expense Fine Art Department.....	3,555 22
“ expense Agricultural Department	1,574 65
“ expense Horticultural Department.....	966 05
“ expense Floricultural Department.....	2,276 19
“ expense Live Stock Department.....	2,497 44
“ expense Department Mining and Metallurgy.....	413 45
“ expense Department of Mechanics and Machinery.....	898 77
“ expense Department of Merchandise.....	643 32
“ expense Department Commerce and Transportation.....	604 85
“ expense Department of Printing and Journalism.....	413 45
“ expense Department of Woman's Work.....	2,238 81
“ expense Department of Public Services and Charities.....	173 17
“ expense Department of Entertainments.....	712 50
“ expense Department of Manufactures.....	464 40
“ expense of members.....	2,337 56
“ expense forage and meals.....	375 35
“ office expense.....	1,285 99
“ postage and telegraph.....	2,377 39
“ express, freight and drayage.....	1,433 02
“ salary of Director General.....	1,779 82
“ building contracts, J. Hamberger & Co.....	44,547 87
“ building contracts, Wm. Saint.....	24,293 49
“ salary of Assistant Secretary Graham	1,562 50
“ salary of Superintendent of Grounds.. ..	270 00
“ clerk hire.....	1,812 53
“ architects, E. Terrell & Co.....	1,984 38
“ building contracts, to W. F. Smith & Son.....	511 00
“ building contracts, to Kotterman & Knecht.....	2,253 38
“ expense Commissioner of Transportation	401 55
“ building contracts to H. N. Ford.....	1,843 00
“ “ “ A. K. Rarig & Co., (engine boilers, etc.)	7,401 10
“ refunded entrance.....	221 40
“ rents, insurance, etc.....	10,716 23
“ bands	3,320 25
“ police	3,929 95
“ gate-keeper's department.....	1,232 50

REPORT OF BOARD OF

For treasurer's department.....	2,732 55
" percent. to organizations.....	1,535 51
Total disbursements.....	<u>\$209,487 21</u>
From which deduct outstanding, unredeemed checks at this date, January 14, 1889.....	<u>725 07</u>
Showing actual amount paid out by the treasurer.....	\$208,762 14
Which deducted from the total receipts from all sources, shows balance in hands of treasurer January 14, 1889.....	<u>\$3,638 10</u>

LIABILITIES.

For unsettled miscellaneous bills and accounts.....	\$2,465 81
" unpaid premiums.....	4,814 33
" outstanding unpaid checks.....	<u>725 07</u>
Total	<u>\$8,005 21</u>

ASSETS.

The total available assets are represented by the amount that is still due and collectible on the sale of lumber, \$1,805.00.

There is the further sum of \$120.00 due on lumber sale to Candy Bros., of Columbus, O., but the firm having assigned and gone into the hands of a receiver, is not available.

The amount due and available on lumber added to the amount of cash on hand shows, total resources, \$5,443.10.

This amount would fall short of meeting in full all unpaid bills and premiums, by the sum of \$2,562.11; but if settlement can be made on the same basis as other creditors remaining unpaid at close of Centennial were settled with, viz.: 55% to live stock premium holders and 45% to premium holders in the other classes, the amount would be sufficient to cover the claims.

MEMORANDA.

The amount that would be required to pay unsettled bills in full, and re-credit parties who allowed discounts on their premiums in order to make a settlement, would be as follows:

Unsettled bills and accounts.....	\$2,465 81
" premiums.....	4,814 33
Unpaid outstanding checks.....	<u>725 07</u>
Discounts allowed on premiums already paid.....	5,990 66
Total	<u>\$13,995 87</u>
Less cash on hand and available assets.....	<u>5,443 10</u>

Showing total that would be required to make settlement in full on all bills and accounts, and refund discounts made on premiums settled	<u>\$8,552 77</u>
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NOTE.

In the liabilities is not included the unpaid balance due the Ohio State Board of Agriculture, as per contract, on rental of grounds and

buildings. The original amount agreed upon was \$24,500.00, of which there was paid \$10,282.23, leaving a balance of \$14,217.77.

REPORT OF AUDITING COMMITTEE FOR THE FINANCIAL ACCOUNTS OF
THE OHIO CENTENNIAL, TO FIRST CLOSING OF BOOKS,
JANUARY 14, 1889.

The undersigned committee, appointed by Governor Foraker, President of the Ohio State Board of Directors, to examine and audit the financial accounts of the board, respectfully submit the following report:

We began our work by a careful examination of the records of receipts and disbursements, and continued by comparing the journal record with the vouchers and checks corresponding. We find the complete financial transactions of the board fully set forth in the journal and ledger records, and that the vouchers and checks represented therein, compare and are correct.

The receipts from all sources are properly accounted for and correct in amount, and all disbursements have been in accordance with the direction and approval of the board, by checks and orders, properly signed by the Secretary and Director General. This examination and report embraces the accounts from the beginning of the work up to and including January 14, 1889, on which date the books were balanced.

The financial statement recorded in the journal at the close of the accounts up to January 14, and to which this report is appended, we find to be a correct summary of all the accounts, and clearly sets forth the financial transactions of the Board up to the date covered. The general financial condition is also therein correctly represented. On January 1, the unsettled miscellaneous bills and accounts, amounting to \$2,465.81, and represented in the statement under the head of "Liabilities," comprised all the claims, except premiums, that had been presented up to that time. Since that time, however, bills to the amount of \$540.32 have been presented, making the total bills and claims \$3,006.13, which, added to the unpaid premiums and outstanding unpaid checks, would make the total liabilities \$8,545.53, and we believe there are no further claims to be presented, unless it be the discounts that have been made on premiums settled, amounting to \$5,990.66, as shown in the statement, and the amount due the State Board of Agriculture.

Respectfully,

WM. S. FOSTER,
JOHN C. LEVERING.

THE FINANCIAL STATEMENT.

The subjoined financial statement, taken from the books of the Secretary and Treasurer, sets forth in detail all the receipts and expenditures from the organization of the Board, and gives the assets and liabilities of the Board at the present time. Before the close of the Exposition, and when the indications were assuring that the Board would be able to pay all liabilities in full, premiums to the amount of \$24,000 were paid as they were awarded and fell due. When, however, at the close of the Exposition, it was found that we should not be able to pay all in full, the

Board directed a suspension of payments until the actual balance in hand could be determined. When, after the sale of material and the filing of all claims our assets and liabilities were definitely determined, it was found that on the remaining \$16,000 of premiums due, we could pay but 55 per cent. on live stock premiums, and 45 per cent. on all other premiums; thus refunding the ten per cent. entry money paid in by live stock exhibitors, and placing them on the same footing as others.

The Board regretted deeply the necessity for adopting this discount on the premiums yet due. But, under the circumstances, no other course seemed just. Accordingly, the offer was made to all persons to whom premiums were due, and they were asked to accept the pro-rata per cent. of what was due them, until some provision could be made for their payment in full. The amount, therefore, now necessary to meet all claims for premiums in full is about \$8,500, and this, together with a balance due on stipulated rental, to the State Board, is the *apparent* deficit of the Board in the final settlement of its accounts.

All the facts of the case, however, should be taken into account. It may, therefore, be properly stated that in October, 1887, when the State Board of Agriculture leased, and turned over to the Centennial Board the plant of the State Fair grounds, said Board of Agriculture represented that it had certain liabilities falling due during the year that must be met, and that the surrender of the fair grounds to the Centennial Board deprived them of all possible means of making money to meet these obligations. With the conviction that this Board would make money during the Centennial to enable them to fulfill the promise, it was agreed by the Centennial Board to pay to the State Board of Agriculture, as rental, a sum sufficient to enable the State Board to meet its pressing liabilities. This course seemed an actual necessity at the time, since, if these obligations of the State Board of Agriculture were not promptly met, the holders of the liens by which these liabilities were secured, could disturb and greatly embarrass the Centennial Board in the occupancy and improvement of the grounds.

PREMIUMS ON HORSES.

THOROUGHBREDS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. N. Ackerman, Columbus, O.....	Best stallion 4 years and over..	Geo. McCullough.....	\$50 00
Chas. E. Brossman, Lithopolis, O.....	2d " " " " " "	Vanguard.....	25 00
Williams & Leonard, Columbus, O.....	Best stallion 3 yrs. and under 4	Hector.....	40 00
E. Ricketts, Columbus, O.....	2d " " " " " "	Red Fox.....	20 00
A. Miller & Sons, South Bloomfield, O.	Best stallion 2 yrs. and under 3	Haco.....	30 00
Geo. W. O'Harra, Alton, O.....	2d " " " " " "	Vanguard, Jr.....	15 00
J. N. Ackerman, Columbus, O.....	Best stallion 1 yr. and under 2.	Jno. McCullough.....	20 00
same	2d " " " " " "	" " " " " "	10 00
Chas. E. Brossman, Lithopolis, O.....	Best stallion under 1 year.....	" " " " " "	10 00
same	2d " " " " " "	" " " " " "	5 00
E. Ricketts & Son, Black Lick, O.....	Best mare 4 years and over.....	" " " " " "	50 00
same	2d " " " " " "	" " " " " "	25 00
A. Miller & Sons, South Bloomfield, O.	Best mare 3 years and under 4.	Laura N.....	40 00
same	2d " " " " " "	" " " " " "	20 00
J. N. Ackerman, Columbus, O.....	Best mare 2 yrs. and under 3...	Miss McCullough.....	30 00
Chas. E. Brossman, Lithopolis, O.....	2d " " " " " "	" " " " " "	15 00
same	Best filly 1 yr. and under 2.....	" " " " " "	20 00

SWEEPSTAKES.

Owner's name and address.	Age of animal	Name of animal.	Premium.
J. N. Ackerman, Columbus, O.....	Best stallion with 5 of his get, 3 years and under	Geo. McCullough.....	\$100 00
Jno. H. Thompson, Washington, C. H..	Best stallion of any age.....	Dad	50 00
Chas. E. Brossman, Lithopolis, O.....	Best brood mare with foal at side	" " " " " "	50 00

FRENCH DRAFT.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Dillon Bros., Normal, Ill.....	Best stallion 4 years and over..	Papillon	\$50 00
Jos. McCurdy, Ashley, O.....	2d " " " " " "	Dandy Challous.....	25 00
D. S. Moots & Co., Bellefontaine, O....	Best stallion 3 yrs. and under 4	Albana.....	40 00
D. B. Stansell, Ballou, O.....	2d " " " " " "	Gend'arme.....	20 00
Dillon Bros., Normal, Ill.....	Best stallion 2 yrs. and under 3	Blue Mound.....	30 00
same	1 yr. and under 2.....	When	20 00
C. H. McCurdy, Ashley, O.....	2d " " " " " "	Lyon	10 00
Dillon Bros., Normal, Ill.....	Best stallion under 1 year.....	" " " " " "	10 00
E. P. Roloson, West Berlin.....	2d " " " " " "	Chief	5 00
Dillon Bros., Normal, Ill.....	Best mare 4 years and over.....	Modesty G.....	50 00
same	2d " " " " " "	Londoe.....	25 00
same	Best mare 3 yrs. and under 4...	Melissa B.....	40 00

HORSES—FRENCH DRAFT—Continued.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
E. P. Roloson, West Berlin.....	2d best mare 3 yrs. and under 4..	Fairy.....	\$20 00
Dillon Bros., Normal, Ill.....	Best mare 2 yrs. and under 3...	Roxie G.....	30 00
J. A. Weinland, Westerville, O.....	2d " " " " " "	Evaline.....	15 00
Dillon, Bros., Normal, Ill.....	Best filly 1 yr. and under 2.....	" " " " " "	20 00
same " " " " " "	2d " " " " " "	" " " " " "	10 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Dillon Bros., Normal, Ill.....	Stallion to be exhibited with 5 of his colts. ....	.....	\$100 00
same	Stallion of any age.....	.....	50 00
same	Brood mare with foal at side...	.....	50 00

PERCHERON DRAFT.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Pringle & Brentzer, Cardington, O.....	Best stallion 4 years and over..	Sam'l.....	\$50 00
Dr. E. Cunningham, Amanda, O.....	2d " " " " " "	Sultan 5th.....	25 00
Marion Co. Imp. Co., Prospect, O.....	Best stallion 3 yrs. and under 4..	Bow Type.....	40 00
Sam'l Kendeigh, Amherst, O.....	2d " " " " " "	Buckeye Mark.....	20 00
Savage & Farnum, Detroit, Mich.....	Best stallion 2 yrs. and under 3..	Rigolo.....	30 00
Richard Jones, Hilliard, O.....	2d " " " " " "	Col. Jones.....	15 00
Marion County Imp. Co.....	Best stallion 1 yr. and under 2..	Roullemaid.....	20 00
Savage & Farnum, Detroit, Mich.....	2d " " " " " "	Albert Le Grand.....	10 00
Jas. T. Miller, Columbus, O.....	Best mare 4 yrs. and over.....	Aola.....	50 00
Johnson Baker, Jamestown.....	2d " " " " " "	" " " " " "	25 00
Savage & Farnum, Detroit, Mich.....	Best mare 3 yrs. and under 4.....	Babette.....	40 00
same " " " " " "	2d " " " " " "	Fauchon.....	20 00
same " " " " " "	Best mare 2 yrs. and under 3....	Myrtha.....	30 00
J. A. Weinland, Westerville, O.....	2d " " " " " "	France.....	15 00
same " " " " " "	Best filly 1 yr. and under 2.....	Turbulente.....	20 00
Jones Bros., Plain City, O.....	2d " " " " " "	Donon.....	10 00
J. W. Shaw, Cardington, O.....	Best filly under 1 year.....	Queen Ami.....	10 00
Sam'l Kendeigh, Amherst, O.....	2d " " " " " "	Athena.....	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Savage & Farnum, Detroit, Mich.....	Stallion to be exhibited with 5 of his colts.....	Pluviose.....	\$100 00
Fredericktown Importing and B. Co., Fredericktown, O.....	Stallion of any age.....	Bastien.....	50 00
J. W. Shaw, Cardington, O.....	Brood mare with foal at side...	Victoria.....	50 00

AWARDS.

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HORSES—BELGIAN DRAFT.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Sam'l Taylor, Pleasant Corners, O.....	Best stallion 4 years and over..	Modoc	\$50 00
same	Best mare 4 years and over.....	Fannie	50 00
B. W. Bell, Sunbury, O.....	2d " " " "	Lottie	25 00
Sam'l Taylor, Pleasant Corners, O.....	Best mare 3 years and under 4..	Ruby.....	40 00
same	Best filly 1 year and under 2....	Nellie	20 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Sam'l Taylor, Pleasant Corners, O.....	Stallion to be exhibited with 5	Modoc	\$100 00
same	of his colts	"	50 00
	Best stallion any age		

CLYDESDALE DRAFT.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. E. Taylor, Plain City, O.....	Best stallion 4 years and over..	Young Saulsbury.....	\$50 00
D. J. Nicely, Union City, Ind.....	2d " " " "	Knight of Gordon.....	25 00
same	Best stallion under 1 year.....	Young Biron.....	10 00
same	2d " " " "	Duchess	25 00
same	Best mare 3 years and under 4..	Jin	40 00
Wm. Howard, Irwin, O.....	Best mare 2 years and under 3..	.....	30 00
D. J. Nicely, Union City, Ind.....	Best filly under 1 year	Daisy.....	10 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Henry Wilkinson, South Charleston..	Stallion of any age	Blackberry.....	\$50 00

HORSES—SHIRE DRAFT.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Fredericktown Importing and Br. Co., Fredericktown, O.....	Best stallion 4 years and over..	Caractacus.....	\$50 00
Bell Bros., Wooster, O.....	2d " " " " " "	King of the Fens.....	25 00
Dye & Stilwell, Troy, O.....	Best stallion 3 yrs. and under 4	Flashwood.....	40 00
same	2d " " " " " "	" " " " " "	20 00
same	Best stallion 2 yrs. and under 3	" " " " " "	30 00
Bell Bros., Wooster, O.....	2d " " " " " "	Belvidere.....	15 00
same	Best stallion under 1 year.....	" " " " " "	10 00
Guy & Newman, Mechanicsburg, O...	Best mare 4 years and over.....	Lady Singleton.....	50 00
Bell Bros., Wooster, O.....	2d " " " " " "	Lively.....	25 00
Dye & Stilwell, Troy, O.....	Best mare 3 years and under 4..	Belle of the Shires.....	40 00
same	2d " " " " " "	Pride.....	20 00
same	Best mare 2 years and under 3..	Queen Charming.....	30 00
Bell Bros., Wooster, O.....	Best filly 1 year and under 2....	Flora.....	20 00
Dye & Stilwell, Troy, O.....	2d " " " " " "	Roxie.....	10 00
Bell Bros., Wooster, O.....	Best filly under 1 year.....	Topsey.....	10 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Bell Bros., Wooster, O.....	Stallion to be exhibited with 5 of his colts.....	King.....	\$100 00
Fredericktown Importing and Br. Co., Fredericktown, O.....	Stallion of any age.....	" " " " " "	50 00

GRADE DRAFT.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. T. Sager, Marble Cliff, O.....	Best stallion 4 years and over...	Mugridge.....	\$50 00
David Bulger, Fredericktown, O.....	2d " " " " " "	Prince.....	25 00
same	Best stallion 3 yrs. and under 4	David B.....	40 00
Bunting & Jones, Bridgeville, O.....	2d " " " " " "	Young Fred.....	20 00
Jas. A. Kile, Plain City, O.....	Best stallion 2 yrs. and under 3	Robert.....	30 00
Chas. F. Sanford, Rosedale, O.....	2d " " " " " "	Silver.....	15 00
Geo. Sellers, Cardington, O.....	Best stallion 1 yr. and under 2..	" " " " " "	20 00
E. P. Rotson, West Berlin, O.....	2d " " " " " "	Nogent.....	10 00
O. E. Westbrook, Stantontown, O.....	Best stallion under 1 year.....	Duke.....	10 00
Ph. Schwaderer, Green Camp, O.....	2d " " " " " "	Bayard.....	5 00
D. B. Stansell, Ballou, O.....	Best mare 4 years and over.....	Arizona.....	50 00
J. A. Weinland, Westerville, O.....	2d " " " " " "	Josephine.....	25 00
E. Gatton, Galloway, O.....	Best mare 3 yrs. and under 4..	Easter.....	40 00
Walter Craven, Sparta, Ohio.....	Best mare 2 yrs. and under 3..	" " " " " "	30 00
Chas. Emerson, Chesterville, O.....	2d " " " " " "	" " " " " "	15 00
Royal More, Sparta, O.....	Best filly 1 year and under 2....	" " " " " "	20 00
Ph. Schwaderer, Green Camp, O.....	2d " " " " " "	" " " " " "	10 00
same	Best filly under 1 year.....	" " " " " "	10 00

HORSES—SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. T. Miller, Columbus, Ohio.....	Stallion to be exhibited with 5 of his colts.....	General	\$100 00
J. T. Sager, "	Stallion of any age	Mugridge	50 00
O. E. Westbrook, Stantontown, O.....	Brood mare with foal at side...	Grand Duchess.....	50 00

CLEVELAND BAY.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Bell Bros., Wooster, O	Best stallion 4 years and over..	Coachman	\$50 00
Dwight Gay, Columbus, O.....	2d " "	Prince Albert	25 00
same	Best mare 4 years and over.....	Lucy	50 00
same	Best filly 1 year and under 2...	Lucy May.....	20 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Dwight Gay, Columbus, O.....	Best stallion of any age.....	Frank Herrod.....	\$50 00

FRENCH COACH.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Otho Curl, Cardington, O.....	Best stallion 4 years and over...	Escobas'.....	\$50 00
Savage & Farnum, Detroit, Mich.....	2d " "	General	25 00
same	Best mare 4 years and over.....	Baccarat	50 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Johnson & Baker, Jamestown, O.....	Best stallion of any age .....	.....	\$50 00

HORSES—MATCHED.

Owner's name and address.	Matched horses.	Name of animal.	Premium.
Dye & Stilwell, Troy, O.....	Best pair matched draft mares	.....	\$50 00
B. W. Bell, Sunbury, O.....	2d " " .....	.....	20 00
Geo. W. Crawford, Newark, O.....	Best pair matched draft geldings.....	.....	50 00
M. K. Wright, Jeffersonville, O.....	Best pair matched coach geldings.....	.....	50 00
F. A. Rose, Cardington, O.....	2d best pair matched coach geldings.....	Jim and Tom	20 00

GRAND SWEEPSTAKES—COACH.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. C. Levering, Leverings, O.....	Best stallion and 5 of his colts..	Kokosing Buckner.....	\$100 00
Otho Curl, Cardington, O.....	Best stallion any age	Escobas	100 00

SHETLAND PONIES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Dye & Stilwell, Troy, O.....	Best stallion any age .....	.....	\$10 00
Jones Bros., Plain City, O.....	2d " "	Tom Thumb.....	5 00
Dye & Stilwell, Troy, O.....	Best mare any age.....	.....	10 00
Jones Bros., Plain City, O.....	2d " "	Daisy.....	5 00
same	Best colt under 1 year old .....	.....	5 00
Savage & Farnum, Detroit, Mich.....	2d " " .....	.....	3 00
Dye & Stilwell, Troy, O.....	Best herd not less than 7 head..	.....	20 00
Jones Bros., Plain City, O.....	2d " " .....	.....	10 00
same	Handsomest pony turnout by boy or girl	Tom Thumb & mate..	10 00
H. L. Long, Hayesville.....	2d best handsomest turnout by boy or girl.....	Maud S. and Mountain Pink.....	5 00

HORSES—PONY RACE UNDER SADDLE—ONE-HALF MILE DASH.

Owner's name and address.	Premiums.	Name of animal.	Premium.
E.S. Long, Hayestville, O.....	1st premium.....	Maud S.....	\$25 00
Benton Clifton, Aetna, O.....	2d ".....	Indian Jack.....	10 00
W.O. Long, Hayestville, O.....	3d ".....	Mountain Pink.....	10 00

SADDLE.

Owner's name and address.	Premiums.	Name of animal.	Premium.
Aaron Weaver, Rosedale, O.....	Best stallion for saddle.....	Spartan, Jr.....	\$25 00
W.I. Wood, Williamsport, O.....	2d ".....	Diamond.....	10 00
same	Best mare for saddle.....		25 00
Geo McConnel, Urbana, O.....	2d ".....	Belle.....	10 00
C.F. Morgan, Plain City, O.....	Best gelding for saddle.....	Lord Lofty.....	25 00
J.B. Vause, Lockbourne, O.....	2d ".....	Cap.....	10 00

SWEEPSTAKES.

Owner's name and address.	Premiums.	Name of animal.	Premium.
C.F. Morgan, Plain City, O.....	Best mare or gelding.....	Lord Lofty.....	\$50 00

EQUESTRIAN.

Owner's name and address.	Premiums.	Name of animal.	Premium.
Minnie Hess, Clifton, O.....	Best exhibition of horsemanship by lady.....		\$50 00
Miss Annie Vause, Lockbourne, O.....	2d best exhibition of horsemanship by lady.....		35 00
G.W. Crawford, Newark, O.....	3d best exhibition of horsemanship by lady.....		15 00
Birdie Hess, Clifton, O.....	4th best exhibition of horsemanship by lady.....		10 00
Geo. W. Crawford, Newark, O.....	Best exhibition of horsemanship by boy under 14.....		25 00
Geo. McConnel, Urbana, O.....	2d best exhibition of horsemanship by boy under 14.....		15 00
J.B. Vause, Lockbourne, O.....	Best exhibition of horsemanship by gent and lady.....		50 00
A.S. Hess, Clifton, O.....	2d best exhibition of horsemanship by gent and lady.....		25 00
Ed. Hyde.....	3d best exhibition of horsemanship by gent and lady.....		15 00

HORSES—ROADSTERS STANDARD BRED.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. W. Fitzgerald, Maysville, Ky.....	Best stallion 4 years and over...	F. Enterprise.....	\$50 00
F. Alexander, for S. E. Pugh, Colum- bus, O.....	2d " " "	Royal Medium.....	25 00
D. V. Grace, Chillicothe, O.....	Best stallion 3 yrs. and under 4	South Brauch.....	40 00
C. F. & Wm. Bishop, Jerome, O.....	2d " " "	Aicline.....	20 00
J. W. Fitzgerald, Maysville, Ky.....	Best stallion 2 yrs. and under 3	Reception.....	30 00
C. W. Story, Chillicothe, O.....	2d " " "	Red Letter.....	15 00
J. W. Fitzgerald, Maysville, Ky.....	Best stallion 1 yr. and under 2.	Mozzantine.....	20 00
A. R. Miller, Pataskala, O.....	2d " " "	Violin.....	10 00
L. D. Converse & Bro., Urbana, O.....	Best mare 4 years and over.....	Cherry Bay.....	50 00
Jos. Smith, Circleville, O.....	2d " " "	Rubble.....	25 00
J. W. Fitzgerald, Maysville, Ky.....	Best mare 3 years and under 4.	Miss Davis.....	40 00
O. P. Chaney, Canal Winchester, O.....	2d " " "	Frou Frou.....	30 00
J. Buckingham, Zanesville, O.....	Best mare 2 years and under 3.	Victorine.....	15 00
L. D. Converse & Bro., Urbana, O.....	2d " " "	Nix.....	20 00
same	Best filly 1 year and under 2.....	Brown Bread.....	10 00
C. W. Story, Chillicothe, O.....	2d " " "	Mabel C.....	10 00
L. D. Converse & Bro., Urbana, O.....	Best filly under 1 year.....		5 00
O. P. Chaney, Canal Winchester, O.....	2d " " "		

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
D. V. Grace, Chillicothe, O.....	Best stallion with 5 of his get..	Referee.....	\$100 00
Wes. Hardman, Cable, O.....	Brood mare with foal at side..	Lady Washington.....	50 00

ROADSTERS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
C. O. Taylor, Urbana, O.....	Best stallion 4 years and over..	Khedive.....	\$50 00
J. W. Fitzgerald, Maysville, Ky.....	2d " " "	Fitz. Enterprise.....	25 00
R. Brock & Son, Gladstone, O.....	Best stallion 3 yrs. and under 4	Roscoe M.....	40 00
Wm. Wilcox, Columbus, O.....	2d " " "	Lyman.....	20 00
C. W. Story, Chillicothe, O.....	Best stallion 2 yrs. and under 3	Red Letter.....	30 00
J. W. Fitzgerald, Maysville, Ky.....	2d " " "	Reception.....	15 00
same	Best stallion 1 yr. and under 2.	Mazzantine.....	20 00
A. R. Miller, Pataskala, O.....	2d " " "	Violin.....	10 00
G. W. Crawford, Newark, O.....	Best stallion under 1 year.....	Aristides.....	5 00
G. & F. Evans, Pataskala, O.....	2d " " "	Maud W.....	50 00
Benj. L. Shook, Upper Sandusky, O...	Best mare 4 years and over.....	Little Duchess.....	25 00
Geo. A. Bean, Washington C. H., O.....	2d " " "	Lady Pennypack.....	40 00
A. R. Miller, Pataskala, O.....	Best mare 3 years and under 4.	Miss Davis.....	20 00
J. W. Fitzgerald, Maysville, Ky.....	2d " " "	Victorine.....	30 00
L. D. Converse & Bro., Urbana, O.....	Best mare 2 years and under 3.	Frou Frou.....	15 00
J. Buckingham, Zanesville, O.....	2d " " "	Nix.....	15 00
L. D. Converse & Bro., Urbana, O.....	Best filly 1 year and under 2.....	Flo. Alert.....	10 00
A. R. Miller, Pataskala, O.....	2d " " "	Maud C.....	10 00
L. D. Converse & Bro., Urbana, O.....	Best filly under 1 year.....	Bertha Crow.....	5 00
Geo. Shamps, Shiloh, O.....	2d " " "		

AWARDS.

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ROADSTERS—SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
E. Courtright, Galloway, O.....	Best stallion with 5 of his get..	Hercules	\$100 00
D. & F. Evans, Pataskala, O.....	Brood mare with foal at side...	Katie Middleton.....	50 00

GELDINGS AND MARES FOR LIGHT HARNESS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Edwin Eberly, Columbus, O.....	Best gelding 4 years and over...	Dildine	\$30 00
J. W. Fitzgerald, Maysville, Ky.....	2d "	Limestone	10 00
Wm. Wall, Columbus, O.....	Best gelding 3 yrs. and under 4	Billy Golddust.....	25 00
Geo. H. Smith, Chillicothe, O.....	Best gelding 2 yrs. and under 3	"	20 00
Chas. Allen, Columbus, O.....	2d "	King A.....	10 00
D. & F. Evans, Pataskala, O.....	Best gelding 1 yr. and under 2.	Gold Leaf.....	15 00
Geo. A. Bean, Washington C. H., O.....	Best mare 4 years and over...	Little Duchess.....	30 00
J. P. Chaney, Canal Winchester, O....	2d "	Jessie Golfax.....	10 00
A. R. Miller, Pataskala, O.....	Best mare 3 years and under 4.	Lady Pennypack.....	25 00
J. W. Fitzgerald, Maysville, Ky.....	2d "	Miss Davis	10 00
A. R. Miller, Pataskala, O.....	Best mare 2 years and under 3.	Alta	20 00
J. D. Converse & Bro., Urbana, O.....	2d "	"	10 00
C. W. Story, Chillicothe, O.....	Best mare 1 year and under 2...	Brown Bread.....	15 00
A. R. Miller, Pataskala, O.....	2d "	Orange Leaf.....	5 00
Chas. D. Gill, Millersport, O.....	Best pair matched geldings.....	"	40 00
W. A. France, Columbus, O.....	2d "	"	20 00
Benj. L. Shook, Upper Sandusky, O....	Best pair matched mares.....	"	40 00
A. H. Marvin, Urbana, O.....	2d "	"	20 00

AMERICAN COACH.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
C. C. Levering, Leverings, O.....	Best stallion 4 years and over..	Kokosing Buckner.....	\$50 00
J. Humphreys, West Hayden, O.....	Best stallion 3 yrs. and under 4	Humphrey Boy.....	40 00
A. Werts, Leverings, O.....	Best stallion 1 yr. and under 2..	"	20 00
J. N. Sowers, Woodview, O.....	2d "	Rowdy Boy	10 00
J. W. Purdam, Plain City, O.....	Best stallion under 1 year.....	Allude	10 00
Chas. Atkinson, Galion, O.....	Best mare 1 year and under 2...	"	20 00
John Lynn, Andrews, O.....	2d "	"	10 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
C. C. Levering, Leverings, O.....	Best stallion with 5 of his get..	.....	\$100 00
J. Humphreys, West Hayden, O.....	Best stallion of any age.....	.....	50 00
J. W. Purdam, Plain City, O.....	Best mare of any age.....	Nettle More.....	50 00

SUMMARY OF THE RACES.

NOVELTY RUNNING RACES.

HURDLE RACE.

J. N. Ackerman, Columbus, Ohio, c. s. Geo. McCullough.....	1
Wm. Tatman, Columbus, Ohio, b. g. Breyfogle.....	2
Ad. Miller, South Bloomfield, Ohio, s. g. Royal V.....	3
Time: 1:59 $\frac{3}{4}$.	

RUNNING TO HARNESS.

C. E. Brossman, Lithopolis, Ohio, b. m. Staunch.....	1
Chas. Slagel, West Jefferson, Ohio, b. g. King Dan.....	2
Chas. Simpson, Columbus, Ohio, s. s. Joe Russell.....	3
Time: 2:06 $\frac{1}{2}$.	

OPENING SCRAMBLE.

J. T. Carmody, Richwood, Ohio, ch. s. Rebellion.....	1
Oriole Stables, Portsmouth, Ohio, b. g. Mulligan.....	2
Apto Stables, Fremont, Ohio, b. m. J. McFarland.....	3
Time: 1:06.	

SELLING RACE.

J. T. Carmody, Richwood, Ohio, ch. g. Gold Star.....	1
Williams & Leonard, Columbus, Ohio, ch. s. Hector.....	2
J. N. Ackerman, Columbus, Ohio, b. g. St. Nick.....	3
Time: 1:20.	

RUNNING—ALL AGES.

J. A. Hall, Columbus, Ohio, ch. m. Pocahontas.....	1	4
J. W. Hayes, Washington C. H. b. m. Andrey.....	2	1
R. E. Broadway, Chicago, Ill., s. g. Fraud.....	3	3
Oriole Stables, Youngstown, Ohio, ch. m. Sallie L.....	4	5
W. E. Cotton, New York, ch. g. Danville.....	5	2
Time: 53, 53 $\frac{3}{4}$.		

CENTENNIAL DERBY.

Williams & Leonard, Columbus, Ohio, s. s. Hector.....	1
Pat. Malloy, Lafayette, Ind., b. g. Park Hill.....	2
W. Wellwood, Mt. Victory, Ohio, Simon Kenton.....	3
Time: 1:49.	

ONE-HALF MILE-DASH FOR TWO-YEAR-OLDS.

J. H. Thompson, Washington C. H., Ohio, b. m. Cora L.....	
Oriole Stables, Youngstown, Ohio, br. m. Harmony.....	2
Time: .54 $\frac{1}{2}$.	

SELLING RACE.

W. E. Cotton, New York, ch. m. Theora.....	1
P. McCauley, Lafayette, Ind., b. g. Antonia.....	2
Time: 1:47.	

SUMMARY OF THE RACES.

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HURDLE RACE.

R. E. Broadway, Chicago, Ill., g. g. Linguist	1
Wm. Tatman, Columbus, Ohio, b. g. Breyfogle.....	2
J. N. Ackerman, Columbus, Ohio, ch. s. Geo. McCullough	3
Time: 1:34 $\frac{3}{4}$.	

CATCH WEIGHTS.

Apto Stables, Fremont, Ohio, b. m. J. M. Farland	1
J. T. Carmody, Richwood, Ohio, b. g. Contest	2
Time: $\frac{1}{2}$ mile dash, 50.	

OHIO MERCHANTS' STAKES.

Phil. McCauley, Lafayette, Ind., b. g. Somerset.....	1
J. N. Ackerman, Columbus, Ohio, b. g. St. Nick	2
same b. g. Noonday	3
Time: 1:52 $\frac{1}{2}$, 1 $\frac{1}{8}$ mile-dash.	

FOR ALL AGES— $\frac{1}{4}$ MILE HEATS.

W. McKinney, Portsmouth, Ohio, br. g. Mulligan.....	1
J. T. Carmody, Richwood, Ohio, ch. g. Gold Star	2
J. W. Hayes, Washington C. H., Ohio, b. m. Andrey	3
Time: 1:19 $\frac{3}{4}$, 1:19.	

HURDLE RACE—1 $\frac{1}{2}$ MILE-DASH.

R. E. Broadway, Chicago, Ill., g. g. Linguist	1
J. N. Ackerman, Columbus, Ohio, b. g. Breyfogle.....	2
same b. s. Geo. McCullough.....	3
Time: 2:56 $\frac{3}{4}$.	

COMMEMORATIVE CUP STAKES.

Williams & Leonard, Columbus, Ohio, s. s. Hector.....	1
J. N. Ackerman, Columbus, Ohio, b. g. Noonday	3
same b. g. St. Nick.....	3
Time: 2:15.	

SELLING RACE.

P. McCauley, Lafayette, Ind., b. g. Antonia.....	2	1	1
W. E. Cotton, New York, ch. m. Theora.....	1	2	2
Time: 1:47, 1:46, 1:48.			

LADIES' STAKES.

Phil. McCauley, Lafayette, Ind., b. g. Somerset.....	1
J. N. Ackerman, Columbus, Ohio, b. g. Noonday	2
Time: 1:47.	

MAIDENS' RACE.

J. N. Ackerman, Columbus, Ohio, b. g. St. Nick	1
Phil. McCauley, Lafayette, Ind., b. m. Christpine	2
Time: $\frac{3}{4}$ mile, 1:19.	

CONSOLATION PURSE.

T. J. Richcreek, Warsaw, Ind., ch. g. Overton.....	1
R. E. Broadway, Chicago, Ill., blk. s. Vattel.....	2
J. W. Hayes, Washington C. H., Ohio, s. m. Minnie Hegler	3
Time: 1:47 $\frac{1}{2}$.	

TROTTING AND PACING.

3:30 CLASS—TROTTING.

S. Bowen, Rushville, Ind., b. g. Chester C.....	1	1	1
H. Simons, Bowling Green, Ohio, b. m. Rina B.....	2	2	2
J. K. P. Hale, St. Mary's, Pa., ch. m. Queen.....	3	4	5
M. Critchfield & Co., Howard, Ohio, b. m. Duchess.....	4	3	4
Chas. Grant, Cincinnati, Ohio, b. m. Belle R.....	5	6	3
Nevin Bros., N. Waterford, Ohio, b. s. Mambrino Hedgeford.....	6	5	6

Time: 2:35½, 2:36¼, 2:36.

2:35 CLASS—TROTTING.

John S. Lackey, Cambridge, Ind., ch. s. Wayne Wilson.....	1	1	1
J. J. Crawford, Toronto, Ohio, h. s. Young Stockbridge.....	2	2	2
Geo. A. Bean, Washington C. H., Ohio, Little Duchess.....	3	4	5
O. P. Chaney, Canal Winchester, Ohio, ch. s. Hamil.....	4	6	3
Chas. Grant, Cincinnati, Ohio, Ivory Girl.....	5	5	6
F. M. Taylor, Marysville, Ohio, b. g. Milford.....	6	3	4
W. H. Stickle, Bay City, Mich., g. g. Stickle's Kirkwood.....	Dis.		

Time: 2:32½, 2:33½, 2:33.

PIONEER STAKES.

R. F. Myers, Dayton, Ohio, b. s. Stockwell.....	1	1	
L. D. Converse & Bro., Urbana, Ohio, blk. m. Nix.....	2	2	
C. F. & Wm. Bishop, Jerome, Ohio, b. s. Chilham.....	3	3	

Time: ½ mile, 1:34¼, 1:35.

2:30 CLASS—TROTTING.

Wm. Vanputten, Holland, Mich., ch. s. Turk.....	1	3	1	2	2
Blair & Kingman, Columbus, Ohio, ch. m. Kittle B.....	2	2	3	4	5
S. Thorman, Cleveland, Ohio, ro. g. Dan Huff.....	3	5	5	5	3
H. H. Gessells, Marysville, Ohio, y. b. g. Buckskin Dick.....	4	1	2	1	1
J. Buckingham, Zanesville, Ohio, ch. s. Altar.....	5	4	4	3	4

Time: 2:33, 2:32¼, 2:33¼, 2:30.

2:25 CLASS—PACING.

J. A. Gorman, Richmond, b. m. Belva Lockwood.....	1	1	1
U. H. Odell, Washington C. H., Ohio, b. g. Laveene.....	2	3	5
Mart. Quinn, N. Manchester, Ind., b. g. Sunrise.....	3	2	2
W. H. Snyder, Springfield, Ohio, g. g. Gray John.....	4	4	4
A. Mason, Columbus, Ohio, b. g. Billy Fleming.....	5	5	3
H. Simons, Bowling Green, Ohio, b. m. Ella P.....	Dis.		

Time: 2:23¼, 2:25, 2:25½.

EUREKA STAKES.

C. W. Story, Chillicothe, Ohio, b. m. Metal.....	1	2	1
M. A. Nipgen, Dayton, Ohio, blk. s. Raphael Wilkes.....	2	3	2
E. E. Welch, Delaware, Ohio, Baron Russell.....	3	1	4
L. D. Converse & Bro., Urbana, Ohio, blk. m. Victorine.....	4	Dis.	
J. W. Smith, Shawhan, Ky., b. m. Bessie.....	5	0	5
O. Whitson, N. Burlington, Ohio, b. m. Madge.....	6	0	3

Time: 2:45¼, 2:45½, 2:45¼.

2:20 CLASS—TROTTING.

W. A. Stanborn, Sterling, Ill., b. s. Williams.....	1	3	4	2
John Dickerson, Indianapolis, Ind., b. g. Almont.....	2	2	3	4
J. S. Ryan, Marvel.....	3	6	5	5
S. C. Phillips, Washington C. H., Ohio, b. m. Lottie W.....	4	4	4	3
J. W. Fitzgerald, Maysville, Ky., b. g. D. C. S.....	5	1	1	1
J. W. Voglesong, Elyria, Ohio, b. m. Plush.....	6	5	6	dr.
Jos. Webster, Jersey City, N. J., blk. s. Ambassador.....	7	7	7	6

Time: 2:27, 2:24¼, 2:24¼, 2:24¼.

2:40 CLASS—PACING.

J. A. Hall, Columbus, Ohio, b. m. Kitty C.....	0	1	1	0	1
J. S. Smith, Circleville, Ohio, Pickaway.....	0	0	6	0	2
R. J. Hunt, East Saginaw, ch. m. American Girl.....	3	0	2	4	5
J. D. Poston, Columbus Ohio, blk. m. Iverene.....	4	4	5	dis.	
B. P. Hord, Marion, Ohio, br. m. Scioto Girl.....	5	5	dis.		
W. J. McKinney, Braddock, Pa., b. m. Bessemer.....	6	7	4	5dr.	
Chas. Grant, Cincinnati, Ohio, d. m. Daisy Wood.....	7	8	7	6	4
Samuel Keys, Pittsburgh, Pa., Dallas.....	8	6	3	3	3
F. M. Taylor, Marysville, Ohio, b. m. Amy T.....	9	dis.			

Time: 2:28, 2:26, 2:31, 2:24½, 2:25½.

2:40 CLASS—TROTTING.

John S. Lackey, Cambridge, Ind., b. s. Anderson Wilkes.....	1	1	1		
Orion Dodds, Dayton, Ohio, br. m. Lillian D.....	2	5	2		
J. J. Crawford, Toronto, Ohio, b. s. Young Stockbridge.....	3	6	5		
S. C. Belknap, Columbus, Ohio, ch. s. Hannis, Jr.....	4	3	4		
J. Dickerson, Indianapolis, Ind., g. m. Miss Fallahe.....	5	2	3		
J. C. Owen, Maysville Ky., b. g. Limestone.....	6	4	6		
Neven Bros., N. Waterford, Ohio, b. s. Mambrino Hedgeford.....	7	dr.			

Time: 2:30¼, 2:32¼, 2:44½.

3:00 MINUTE CLASS—TROTTING.

S. T. Bryce, Dayton, Ohio, b. g. Danger.....	1	1	2	2	2
J. K. P. Hall, St. Mary's, Pa., Queen.....	2	2	dis.		
Chas. Grant, Cincinnati, Ohio, Belle R.....	3	3	1	1	1

Time: 2:49½, 2:42, 2:39½, 2:41, 2:48.

2:27 CLASS—TROTTING.

S. J. Beebe, Columbus, Ohio, Clay Davis.....	1	1	0	4	4	3
Wm. Vanputten, Holland, Mich., ch. s. Turk.....	2	4	3	3	5	
J. Dickerson, Indianapolis, Ind., b. m. Katie Wood.....	3	3	0	2	2	2
J. W. Fitzgerald, Maysville, Ky., b. m. Pearl Medium.....	4	5	5	1	1	1
F. D. Clarke, Chicago, Ill., b. g. Prince.....	5	2	4	5	3	
Williams & Invinall, Upper Sandusky, Ohio, b. g. Freddy J.....	Dis.					

Time: 2:35½, 2:35¼, 2:31¾, 2:34½, 2:32, 2:31.

CENTENNIAL STAKES—THREE-YEAR-OLD TROTTERS.

J. W. Fitzgerald, Maysville, Ky., b. s. McAllister.....	1	1			
W. D. Swezey, Marion, Ind., blk. m. Vesta.....	2	3			
Geo. Shambis, Shiloh, Ohio, ch. s. Old Crow.....	3	dis.			
J. W. Smith, Shawhan, Ky., b. s. Boylight.....	4	2			
J. R. Crain, Urbana, Ohio, b. s. Tom Crain.....	Dis.				

Time: 2:42½, 2:40.

FREE FOR ALL—TROTTING.

S. C. Phillips, Washington C. H., Ohio, b. m. Lottie W.....	1	3	2	2	
J. Dickerson, Indianapolis, Ind., b. g. Almont.....	2	1	1	1	
F. D. Clark, Chicago, Ill., b. m. Betty Jones.....	3	4	4	dis.	
J. W. Vogelsong, Elyria, Ohio, b. m. Plush.....	4	2	3	3	

Time: 2:26, 2:28½, 2:27½, 2:25½.

PACING—FREE FOR ALL.

J. Dickerson, Indianapolis, Ind., g. g. Gray Harry.....	1	1	1		
J. K. P. Hall, St. Mary's, Pa., Puritan.....	2	6	6		
Samuel Keys, Pittsburgh, Pa., Charley Friel.....	3	4	3		
J. W. Voglesong, Elyria, Ohio, rn. m. Toledo Girl.....	4	5	5		
Nick Wilson, Hartford, Conn., b. m. Emma.....	5	3	2		
C. A. Carpenter, Findlay, Ohio, b. g. Ben Starr.....	4	5	5		

Time: 2:21, 2:21¼, 2:22.

CATTLE.

SHORTHORNS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
D. D. Richards & Sons, Newark, O.....	Best bull 3 yrs. and over.....	Young Rocket.....	\$50 00
E. S. Butler & Sons, Ridgeway, O.....	Best bull 2 yrs. and under 3.....	.....	30 00
D. D. Richards & Sons, Newark, O.....	Bull calf—best.....	Young Mary's Rocket.....	10 00
E. S. Butler & Sons, Ridgeway, O.....	2d ".....	.....	5 00
D. D. Richards & Sons, Newark, O.....	Best cow 3 yrs. and over.....	Lulu 2d.....	50 00
E. S. Butler & Sons, Ridgeway, O.....	2d ".....	.....	25 00
same.....	Best cow or heifer 2 years and under 3.....	.....	30 00
D. D. Richards & Sons, Newark, O.....	2d best cow or heifer 2 years and under 3.....	Belle of Walnut 8th.....	15 00
E. S. Butler & Sons, Ridgeway, O.....	Best heifer 1 yr. and under 2.....	.....	20 00
D. D. Richards & Sons, Newark, O.....	2d ".....	Red Rose 3d.....	10 00
same.....	Best heifer calf.....	Lulu 3d.....	10 00
same.....	2d ".....	Belle of Walnut 9th.....	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
E. S. Butler & Sons, Ridgeway, O.....	Best herd.....	.....	\$100 00
D. D. Richards & Sons, Newark, O.....	" bull with 4 of his get.....	.....	100 00
E. S. Butler & Sons, Ridgeway, O.....	" " of any age.....	.....	50 00
same.....	" cow with calf at foot.....	Cherry Boy.....	50 00
same.....	" " or heifer.....	.....	50 00

HEREFORDS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Thos. Clark, Beecher, Ill.....	Best bull 3 years and over.....	Prince Edward 2d.....	\$50 00
Fowler & Van Natta, Fowler, Ind.....	2d ".....	Fowler.....	25 00
Adams Earl, Lafayette, Ind.....	Best bull 2 yrs. and under 3.....	Earl of Shadeland 22d.....	30 00
Fowler & Van Natta, Fowler, Ind.....	2d ".....	Cherry Boy.....	15 00
Adams Earl, Lafayette, Ind.....	Best bull 1 year and under 2.....	.....	20 00
Fowler & Van Natta, Fowler, Ind.....	2d ".....	Hickory Grove.....	10 00
Adams Earl, Lafayette, Ind.....	Best bull calf.....	Equity 25th.....	10 00
same.....	2d ".....	Victor of Shadeland.....	5 00
Fowler & Van Natta, Fowler, Ind.....	Best cow 3 years and over.....	Miss Mize.....	50 00
G. W. Henry, Chicago, Ill.....	2d ".....	Edwina.....	25 00
Thos. Clark, Beecher, Ill.....	Best cow 2 yrs. and under 3.....	Peerless 3d.....	30 00
Fowler & Van Natta, Fowler, Ind.....	2d ".....	Pollie Pink.....	15 00
Adams Earl, Lafayette, Ind.....	Best heifer 1 year and under 2.....	Lady Wilton 2d.....	20 00
G. W. Henry, Chicago, Ill.....	2d ".....	Lady Pitt 2d.....	10 00
Fowler & Van Natta, Fowler, Ind.....	Best heifer calf.....	May Fowler.....	10 00
G. W. Henry, Chicago, Ill.....	2d ".....	Annie Laurie.....	5 00

AWARDS.

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SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Fowler & Van Natta, Fowler, Ind.....	Best herd.....		\$100 00
same	Best bull with 4 of his get.....		100 00
Adams Earl, Lafayette, Ind.....	" " of any age.....	Earl of Shadeland 22d	50 00
Fowler & Van Natta, Fowler, Ind.....	" cow with calf at foot.....	Miss Mize.....	50 00
Adams Earl, Lafayette, Ind.....	" " or heifer.....	Lady Wilton 26th.....	50 00

ABERDEEN ANGUS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Benton Garinger, Washington C. H....	Best bull 3 years and over.....	Buffalo Bill.....	\$50 00
same	2 " 2 " under 3.....	Black Baron.....	30 00
Perry Bros., Cable, O.....	2d " " " ".....	Marvel of Kreller.....	15 00
Benton Garinger, Washington C. H....	Best bull 1 year and under 2.....	Nono.....	20 00
same	2d " " " ".....	Midnight.....	10 00
same	Best bull calf.....	Onward.....	10 00
Perry Bros., Cable, O.....	2d " " " ".....	Foraker Perry.....	5 00
same	Best cow 3 years and over.....	Rose of Western Cont.	50 00
Benton Garinger, Washington C. H....	2d " " " ".....	" Coull.....	25 00
same	Best cow 2 yrs. and under 3.....	Maggie.....	30 00
Perry Bros., Cable, O.....	2d " " " ".....	Oefkyma.....	15 00
Benton Garinger, Washington C. H....	Best heifer 1 yr. and under 2.....	Betsey.....	20 00
Perry Bros., Cable, O.....	2d " " " ".....	Marquis.....	10 00
Benton Garinger, Washington C. H....	Best heifer calf.....	Maggie 2d.....	10 00
same	2d " " " ".....	Mida.....	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Benton Garinger, Washington C. H....	Best herd.....	Buffalo Bill.....	\$100 00
same	" bull with 4 of his get.....		100 00
same	" " of any age.....		50 00
same	" cow with calf at foot.....		50 00
same	" " or heifer.....		50 00

GUERNSEYS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. R. Huston, Dayton, O.....	Best bull 3 years and over.....	Lord Butler.....	\$50 00
same	" " calf.....	Evergreen Prince.....	10 00
same	" cow 3 years and over.....	Fannie of the Isles 3d	50 00
same	2d best	Mother Hubbard.....	25 00
same	Best cow or heifer 2 years and under 3.....	Mayda.....	30 00
same	2d best cow or heifer 2 years and under 3.....	Elsie's Belinda.....	15 00
same	Best heifer 1 year and under 2.....	Mayda 2d.....	20 00
same	2d " " " ".....	Grace Hubbard.....	10 00
same	Best heifer calf.....	Rosette of Evergreen..	10 00
same	2d " " " ".....	Lady of Beth.....	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. R. Huston, Dayton, O.....	Best bull of any age.....	Lord Butler	\$50 00

RED POLLED.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. McLain Smith, Dayton, O.....	Best bull 3 years and over.....	Bachelor	\$50 00
E. Smith Jameson, Mt. Sterling, Ky...	" " 2 " under 3.....	"	30 00
J. McLain Smith, Dayton, O.....	" bull calf.....	James	10 00
E. Smith Jameson, Mt. Sterling Ky...	2d "	Daisy 63d.....	50 00
J. McLain Smith, Dayton, O.....	Best cow 3 years and over.....	Lady of Tattleshall.....	25 00
same	2d "	Dawn	30 00
E. Smith Jameson, Mt. Sterling, Ky...	Best cow 2 years and under 3.....	Rhoda	15 00
J. McLain Smith, Dayton, O.....	2d "	Duchess of Suffolk 6th.....	20 00
E. Smith Jameson, Mt. Sterling, O.....	Best heifer 1 year and under 2.....	Haughty	10 00
J. McLain Smith, Dayton, O.....	2d "	Bob	10 00
E. Smith Jameson, Mt. Sterling, Ky...	Best heifer calf.....	Luretta	5 00
J. McLain Smith, Dayton, O.....	2d "	"	"

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. McLain Smith, Dayton, O.....	Best herd.....	"	\$100 00
same	" bull with 4 of his get.....	"	100 00
same	" " of any age.....	Bachelor	50 00
same	" cow with calf at foot.....	Lady of Tattleshall.....	50 00
same	" " or heifer	Daisy 63d.....	50 00

DEVONS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
P. Palmer & Son, Whipple, O.....	Best bull 3 years and over.....	Sam. Houston.....	\$50 00
Irwin York, Brock, O.....	2d "	Brock Boy.....	25 00
J. W. Pollock, Cedarville, O.....	Best bull 2 years and under 3.....	Bronco	30 00
Irwin York, Brock, O.....	2d "	Curly	15 00
J. W. Pollock, Cedarville, O.....	Best bull 1 year and under 2.....	Ogalala.....	20 00
Irwin York, Brock, O.....	2d "	George	10 00
P. Palmer & Son, Whipple, O.....	Best bull calf.....	Protection	10 00
same	2d "	Tansy	5 00
same	Best cow 3 years and over.....	Luna	50 00
J. W. Pollock, Cedarville, O.....	2d "	"	25 00
same	Best cow 2 years and under 3.....	Junia May.....	30 00
Irwin York, Brock, O.....	2d "	Drop	15 00
J. W. Pollock, Cedarville, O.....	Best heifer 1 year and under 2.....	Junia 3d.....	20 00
Irwin York, Brock, O.....	2d "	Siss	10 00
J. W. Pollock, Cedarville, O.....	Best heifer calf	Junia 4th.....	\$30 00
Irwin York, Brock, O.....	2d "	Sonella.....	5 00

AWARDS.

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SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. W. Pollock, Cedarville, O.....	Best herd.....	Sam. Houston.....	\$100 00
P. Palmer & Son, Whipple, O.....	" bull with 4 of his get.....	Bronco	100 00
J. W. Pollock, Cedarville, O.....	" bull of any age .....	.....	50 00
Irwin York, Brock, O.....	" cow with calf at foot.....	.....	50 00
same	" cow or heifer.....	.....	50 00

GRAND SWEEPSTAKES—OPEN TO ALL BEEF BREDS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
G. W. Henry, Chicago, Ill.....	Best herd.....	.....	\$300 00
Adams Earl, Lafayette, Ind.....	" bull of any age	Earl of Shadeland 22d.....	100 00
same	" cow or heifer.....	Lady Wilton 28th.....	100 00

POLLED SHORTHORNS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Shafer & Clawson, Hamilton, O	Best bull 3 years and over.....	Oliver B.....	\$50 00
W. S. Miller, Elmore, O.....	2d "	King of Kine	25 00
Shafer & Clawson, Hamilton, O.....	Best bull calf	Young Surprise.....	10 00
W. S. Miller, Elmore, O	2d "	De Wilton.....	5 00
Shafer & Clawson, Hamilton, O	Best cow 3 years and over	Red Rose.....	50 00
same	2d "	White Rose	25 00
W. S. Miller, Elmore, O	Best cow 2 years and under 3... ..	Plumb	20 00
Shafer & Clawson, Hamilton, O	2d "	Rebecca	15 00
same	Best heifer 1 year and under 2.	White Rose 2d.....	20 00
same	2d "	Lady Symms.....	10 00
same	Best heifer calf.....	Mary	10 00
W. S. Miller, Elmore, O.....	2d "	Cherry	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Shafer & Clawson, Hamilton, O	Best herd.....	.....	\$100 00
same	" bull of any age	Oliver B.....	50 00
same	" cow with calf at foot.....	.....	50 00
same	" cow or heifer.....	.....	50 00

FAT—SWEEPSTAKES.

Owner's name and address.	Group.	Name of animal.	Premium.
John McMillen, Newark, O.....	Best group.....	Shorthorn steers.....	\$200 00

SPECIAL PREMIUMS FOR BEEF BREEDS—BY THE AMERICAN HEREFORD CATTLE BREEDER'S ASSOCIATION.

Owner's name and address.	Pure bred.	Name of animal.	Premium.
Adams Earl, Lafayette, Ind	Best herd of pure bred Herefords, all owned and bred by the exhibitor		\$50 00
same	Best 5 pure bred Herefords		50 00
same	" pure bred Hereford, male.		50 00
same	" pure bred Hereford, female		50 00

JERSEYS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Parsons & Black, North Lewisburg, O..	Best bull 3 years and over.....	Raymond Orr's best son	\$50 00
C. Easthope, Niles, O.....	2d " " " " " " " " " " " "	King of Ashantee.....	25 00
same	Best bull 2 years and under 3.....	Nancy Lee's Ashantee	30 00
J. A. Peasley, Flint, O.....	2d " " " " " " " " " " " "	Queen's Crystal.....	15 00
C. Easthope, Niles, O.....	Best bull 1 year and under 2	Ashantee's Lemon Peel	20 00
J. A. Peasley, Flint, O.....	2d " " " " " " " " " " " "	King's Niantic.....	10 00
Parsons & Black, North Lewisburg, O..	Best bull calf.....	Leyard	10 00
J. A. Peasley, Flint, O.....	2d " " " " " " " " " " " "	Stoke Pogis Star	5 00
C. Easthope, Niles, O.....	Best cow 3 years and over	Lalla Rookh of Sugar Grove	50 00
same	2d " " " " " " " " " " " "	Lady Bountiful.....	25 00
Parsons & Black, North Lewisburg, O..	Best cow or heifer 2 years and under 3.....	Betty Car	30 00
same	2d best cow or heifer 2 years and under 3.....	Hebe's Coomassie.....	15 00
C. Easthope, Niles, O.....	Best heifer 1 year and under 2.....	Ashantee's Little Gem	20 00
Parsons & Black, North Lewisburg, O..	2d " " " " " " " " " " " "	Chloe Nightingale.....	10 00
C. Easthope, Niles, O.....	Best heifer calf.....	Nancy Lee's Daisy	10 00
same	2d " " " " " " " " " " " "	Ashantee's Signarale	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
C. Easthope, Niles, O.....	Best herd.....		\$100 00
same	" bull with 4 of his get.....	King of Ashantee.....	100 00
same	" bull of any age	" " " " " " " " " " " "	50 00
same	" cow with calf at foot	Lalla Rookh.....	50 00
same	" cow or heifer	" " " " " " " " " " " "	50 00

AWARDS.

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AYRSHIRES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Coldren & Lee, Iowa City, Iowa.....	Best bull 3 years and over.....	Satellite.....	\$50 0
J. P. Beatty, Pataskala, O.....	2d ".....	King Dick.....	25 00
A. L. Tubbs, Mexico, N. Y.....	Best bull 2 years and under 3....	Peerless Douglas.....	30 00
T. E. Wight, Millbury, O.....	2d ".....	Fort Meigs.....	15 00
A. L. Tubbs, Mexico, N. Y.....	Best bull 1 year and under 2....	Rosewood Douglas.....	20 00
H. Betts, Wellington, O.....	2d ".....	Fred.....	10 00
Coldren & Lee, Iowa City, Iowa.....	Best bull calf.....	Protection.....	10 00
J. P. Beatty, Pataskala, O.....	2d ".....	Bulus.....	5 00
H. Betts, Wellington, O.....	Best cow 3 years and over.....	Bright eyes.....	50 00
A. L. Tubbs, Mexico, N. Y.....	2d ".....	Ledo Belle.....	25 00
H. Betts, Wellington, N. Y.....	Best cow 2 years and under 3....	Lady Converse 2d.....	30 00
A. L. Tubbs, Mexico, N. Y.....	2d ".....	Kate Donaldson.....	15 00
H. Betts, Wellington, N. Y.....	Best heifer 1 year and under 2....	Lullie A.....	20 0
Coldren & Lee, Iowa City, Iowa.....	2d ".....	Lady Gurta.....	10 0
H. Betts, Wellington, O.....	Best heifer calf.....		10 0
A. L. Tubbs, Mexico, N. Y.....	2d ".....	Joanna Peerless.....	5 0
			0

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
A. L. Tubbs, Mexico, N. Y.....	Best herd.....		\$100 00
H. Betts, Wellington, O.....	" bull with 4 of his get.....		100 00
A. L. Tubbs, Mexico, N. Y.....	" bull of any age.....		50 00
H. Betts, Wellington, O.....	" cow with calf at foot.....		50 00
A. L. Tubbs, Mexico, N. Y.....	" cow or heifer.....		50 00

SHEEP.

MERINOS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. A. Bell, Ashley, O.....	Best ram 3 years*and over	Quinn.....	\$30 00
Willis & Staley, Lewis Center, O.....	2d " "	Cæsar	15 00
R. K. Willis, Lewis Center, O.....	Best ram 2 years and under 3.....	Big Neck	25 00
J. A. Bell, Ashley, O.....	2d " "	" "	10 00
J. A. Showman, Newark, O.....	Best ram 1 year and under 2.....	" "	20 00
R. K. Willis, Lewis Center, O.....	2d " "	Hercules	10 00
J. A. Bell, Ashley, O.....	Best ram lamb	" "	10 00
same	2d " "	" "	5 00
J. L. Hiatt & Sons, Chester Hill, O.....	Best pen of 8 ewes 3 yrs.and over	" "	25 00
R. K. Willis, Lewis Center, O.....	2d " "	" "	15 00
J. A. Bell, Ashley, O.....	Best pen of 8 ewes 2 years under 3.....	-	20 00
J. L. Hiatt & Sons, Chester Hill, O.....	2d best pen of 8 ewes 2 years and under 3.....	" "	10 00
J. A. Bell, Ashley, O.....	Best pen of 3 ewes under 2 yrs. 2d " "	" "	15 00
R. K. Willis, Lewis Center, O.....	" "	" "	10 00
J. A. Bell, Ashley, O.....	Best pen of 3 ewe lambs	" "	15 00
same	2d " "	" "	10 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. A. Bell, Ashley, O.....	Best ram of any age with 5 of his get .....	.....	\$30 00
same	Best flock .....	.....	30 00

DELAINE MERINOS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
John M. Berry, Eighty-four, Pa.....	Best ram 3 years and over	Curtis	\$30 00
same	2d " "	Quaker.....	15 00
same	Best ram 2 years and under 3.....	Bonanza	25 00
J. W. Carpenter, Batesville, O.....	2d " " .....	.....	10 00
Paxton & McEwen, McConnell's M., Pa.	Best ram 1 year and under 2....	.....	20 00
J. W. Carpenter, Batesville, O.....	2d " " .....	.....	10 00
same	Best ram lamb.....	.....	10 00
Paxton & McEwen, McConnell's M., Pa.	2d " " .....	.....	5 00
same	Best pen 3 ewes 3 yrs. and over .....	.....	25 00
John M. Berry, Eighty-four, Pa.....	2d " " .....	.....	15 00
Paxton & McEwen, McConnell's M., Pa.	Best pen 3 ewes 2 yrs. & under 3 .....	.....	20 00
J. W. Pollock, Cedarville, O.....	2d " " .....	.....	10 00
Paxton & McEwen, McConnell's M., Pa.	Best pen of 3 ewes under 2 yrs.	.....	15 00
J. M. Berry, Eighty-four, Pa.....	2d " " .....	.....	10 00
Paxton & McEwen, McConnell's M., Pa.	Best pen of 3 ewe lambs	15 00
J. W. Carpenter, Batesville, O.....	2d " "	10 00

AWARDS.

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SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Paxton & McEwen, McConnell's M., Pa.	Best ram of any age with 5 of his get .....	.....	\$30 00
same	Best flock .....	.....	30 00

LONG WOOLS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Perry Bros., Cable, O.....	Best ram 2 yrs. and under 3.....	Gen. Jackson.....	\$25 00
T. B. Bennington, La Porte, O.....	Best ram 1 year and under 2.....	.....	20 00
Perry Bros., Cable, O.....	2d "	Little Jim.....	10 00
same	Best ram lamb	Punch.....	10 00
same	2d "	Ned	5 00
T. B. Bennington, La Porte, O.....	Best pen of 3 ewes 3 yrs. and over .....	.....	25 00
Perry Bros., Cable, O.....	" 2 yrs. & under 3 .....	.....	20 00
same	" under 2 years .....	.....	15 00
T. B. Bennington, La Porte, O.....	2d " .....	.....	10 00
Perry Bros., Cable, O.....	Best pen of 3 ewe lambs .....	.....	15 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Perry Bros., Cable, O.....	Best ram of any age with 5 of his get.....	.....	\$30 00

OXFORD DOWNS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. M. Evans, Salem, O.....	Best ram 3 years and over	Thaddeus	\$30 00
J. R. & W. A. Shafer, Middletown, O...	2d "	Earl Bathurst.....	15 00
same	Best ram 2 years and under 3...	.....	25 00
J. M. Evans, Salem, O.....	2d " .....	.....	10 00
J. R. & W. A. Shafer, Middletown, O...	Best ram 1 year and under 2...	.....	20 00
J. M. Evans, Salem, O.....	2d "	Plato of Oxford Park	10 00
J. R. & W. A. Shafer, Middletown, O...	Best ram lamb .....	.....	10 00
J. M. Evans, Salem, O.....	2d " .....	.....	5 00
J. R. & W. A. Shafer, Middletown, O...	Best pen of 3 ewes 3 yrs. and over .....	.....	25 00
J. M. Evans, Salem, O.....	2d " .....	.....	15 00
same	Best pen 3 ewes 2 yrs. & under 3 .....	.....	20 00
J. R. & W. A. Shafer, Middletown, O...	2d " .....	.....	10 00
same	Best pen 3 ewes under 2 years..	.....	15 00
J. M. Evans, Salem, O.....	2d "	10 00
J. R. & W. A. Shafer, Middletown, O...	Best pen of 3 ewe lambs	15 00
same	2d "	10 00

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Owner's name and address.	Age of animal.	Name of animal.	Premium.
L. C. Anderson, Anderson, O.....	Best pen 3 ewes under 2 years..	\$15 00
H. A. Frease, Stoutsville, O.....	2d " " " " " " " " " " " "	10 00
G. J. Hagerty & Sons, Hanover, O.....	Best pen of 3 ewe lambs.....	15 00
L. C. Anderson, Anderson, O.....	2d " " " " " " " " " " " "	10 00

Owner's name and address.	Age of animal.	Name of animal.	Premium.
G.J. Hagerty & Sons, Havover, O.....	Best ram of any age with 5 of his get.....		\$30 00

Owner's name and address.	Age of animal.	Name of animal.	Premium.
C. Hills & Son, Delaware, O.....	Wether 2 years and over.....		\$10 00
L. C. Anderson, Anderson, O.....	Wether 1 year and under 2		10 00
C. Hills & Son, Delaware, O.....	2d best wether 2 years and over		5 00

SWINE.

BERKSHIRE.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Clifford & White, Wellington, O.....	Best boar 2 years or over.....	Hero	\$30 00
M. H. Henderson, Harwood, O.....	2d "	Splendid	15 00
D. W. Todd, Urbana, O.....	Best boar 1 year and under 2... ..	Centennial.....	25 00
M. H. Henderson, Harwood, O.....	2d " .....	.....	15 00
D. W. Todd, Urbana, O.....	Best boar 6 mos. and under 1 yr.	Protection	20 00
Geo. L. & O. P. Wolcott, Conover, O.....	2d "	Hero	10 00
same	Best boar under 6 months.....	Snag	10 00
D. W. Todd, Urbana, O.....	2d "	Revenue	5 00
Clifford & White, Wellington, O.....	Best sow 2 years or over.....	Gem.....	25 00
D. W. Todd, Urbana, O.....	2d "	Queen of Ohio	15 00
Geo. L. & O. P. Wolcott, Conover, O.....	Best sow 1 year and under 2... ..	Lady Homestead	20 00
D. W. Todd, Urbana, O.....	2d "	Lady Harrison	10 00
Clifford & White, Wellington, O.....	Best sow 6 mos. and under 1 yr.	Buckeye Belle	15 00
D. W. Todd, Urbana, O.....	2d "	Valina	8 00
Geo. L. & O. P. Wolcott, Conover, O.....	Best sow under 6 months.....	Sallie.....	10 00
G. W. Clark, Woodstock, O.....	2d " .....	.....	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
D. W. Todd, Urbana, O.....	Boar of any age.....	Centennial.....	\$30 00
M. H. Henderson, Harwood, O.....	Sow of any age.....	.....	30 00

POLAND CHINAS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
L. H. Burgess, Milfordton, O.....	Best boar 2 years or over.....	Duke of Oxford.....	\$30 00
Christian Bosse, New Stark, O.....	2d "	Champion	15 00
J. M. Klever, Bloomingburg, O.....	Best boar 1 year and under 2... ..	Surmise	25 00
W. H. Kilburg, Plain City, O.....	2d "	Headlight.....	15 00
H. Bradford, Rochester, O.....	Best boar 6 mos. and under 1 yr.	Helmer	20 00
J. M. Klever, Bloomingburg, O.....	2d " .....	.....	10 00
G. W. Brown, Mt. Gilead, O.....	Best boar under 6 months.....	.....	10 00
Christian Bosse, New Stark, O.....	2d "	Forget me not	5 00
J. M. Klever, Bloomingburg, O.....	Best sow 2 years and over.....	Eulogy	25 00
Robinson & Gustin, Piqua, O.....	2d "	Minnie	15 00
J. M. Klever, Bloomingburg, O.....	Best sow 1 year and under 2... ..	Lottie K.....	20 00
Christian Bosse, New Stark, O.....	2d "	Choice	10 00
J. M. Klever, Bloomingburg, O.....	Best sow 6 mos. and under 1 yr. ....	.....	15 00
Christian Bosse, New Stark, O.....	2d "	Welcome	8 00
H. Bradford, Rochester, O.....	Best sow under 6 months.....	10 00
same	2d "	5 00

AWARDS.

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SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
H. Bradford, Rochester, O.....	Boar of any age	Hector	\$30 00
G. W. Brown, Mt. Gilead, O.....	Sow of any age.....	.....	30 00

CHESTER WHITES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
S. H. Todd, Wakeman, O.....	Best boar 2 years or over.....	World Beater.....	\$30 00
J. H. Eaton, Bucyrus, O.....	2d " "	Cleveland.....	15 00
same	Best boar 1 year and under 2....	Challenge.....	25 00
S. H. Todd, Wakeman, O.....	Best boar 6 mos. and under 1 yr.	Jim	20 00
same	2d " "	Dandy.....	10 00
J. H. Eaton, Bucyrus, O.....	Best boar under 6 months.....	General George 3d	10 00
S. H. Todd, Wakeman, O.....	2d " "	Perfection	5 00
same	Best sow 2 years or over.....	Snowbank	25 00
J. H. Eaton, Bucyrus, O.....	2d " "	Lottie	15 00
S. H. Todd, Wakeman, O.....	Best sow 1 year and under 2....	Get There 2d.....	20 00
J. H. Eaton, Bucyrus, O.....	2d " "	Lady Fern	10 00
S. H. Todd, Wakeman, O.....	Best sow 6 mos. and under 1 yr.	Betty.....	15 00
J. H. Eaton, Bucyrus, O.....	2d " "	Runt	8 00
S. H. Todd, Wakeman, O.....	Best sow under 6 months.....	Dimple.....	10 00
J. H. Eaton, Bucyrus, O.....	2d " "	Dandy.....	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
J. H. Eaton, Bucyrus, O.....	Boar of any age .....	.....	\$30 00
S. H. Todd, Wakeman, O.....	Sow of any age.....	.....	30 00

DUROC JERSEYS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
S. E. Morton, Camden, O.....	Best boar 2 years or over.....	Champion Wonder ...	\$30 00
Sam'l Taylor, Pleasant Corners, O.....	2d " "	Marlowe	15 00
S. E. Morton, Camden, O.....	Best boar 1 year and under 2....	King of Stoves.....	25 00
same	2d " "	Champion	15 00
same	Best boar 6 mos. and under 1 yr.	.....	20 00
same	2d " " .....	.....	10 00
Sam'l Taylor, Pleasant Corners, O.....	Best boar under 6 months.....	.....	10 00
S. E. Morton, Camden, O.....	2d " " .....	.....	5 00
same	Best sow 2 years or over.....	Debby	25 00
same	2d " "	Vernal	15 00
same	Best sow 1 year and under 2....	Debby III	20 00
same	2d " "	Vernal III.....	10 00
same	Best sow 6 mos. and under 1 yr.	Morton's Pride.....	15 00
Sam'l Taylor, Pleasant Corners, O.....	2d " "	Minnie of C 2d.....	8 00
S. E. Morton, Camden, O.....	Best sow under 6 months.....	.....	10 00
same	2d " " .....	.....	5 00

SWEEPSTAKES.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
S. E. Morton, Camden, O.....	Boar of any age	Champion	\$30 00
Sam'l Taylor, Pleasant Corners, O.....	Sow of any age.....	.....	30 00

SUFFOLK, YORKSHIRE, VICTORIA AND ESSEX BREEDS.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
Chas. McClave, New London, O.....	Best herd of Yorkshires .....	.....	\$30 00

BREEDER'S RING.

Owner's name and address.	Age of animal.	Name of animal.	Premium.
G. W. Brown, Mt. Gilead, O.....	Best sow with litter of not less than 5 pigs, under 6 months .....	.....	\$20 00
same	2d best sow with litter of not less than 5 pigs, under 6 mos. ....	.....	10 00
J. M. Klever, Bloomingburg, O.....	Best herd of 1 boar and 4 sows over 1 year, owned by exhibiter .....	.....	25 00
S. H. Todd, Wakeman, O.....	2d best herd of 1 boar and 4 sows over 1 year, owned by exhibiter .....	.....	15 00
J. M. Klever, Bloomingburg, O.....	Best herd of 5 head of swine of any age, the get of 1 boar.....	.....	25 00
S. H. Todd, Wakeman, O.....	2d best herd of 5 head of swine of any age, the get of 1 boar .....	.....	15 00

POULTRY.

INCUBATORS, BROODERS, POULTRY YARD APPLIANCES, ETC.

Owner's name and address.	Best collection.	Premium.
Frank Saumenig, Springfield, O.....	Incubator hatching the largest per cent. of chicks from not less than 100 eggs.....	Medal.
same	2d best incubator hatching the largest per cent. of chicks from not less than 100 eggs....	Dip.
G. S. Singer, Cardington, O.....	Best brooder.....	Medal.
Frank Saumenig, Springfield, O.....	2d "	Dip.
F. & B. Hedden, Columbus, O.....	Display of poultry supplies.....	\$5 00
Chas. McClave, New London, O.....	Best package of eggs packed for shipment.....	3 00
F. & B. Hedden, Columbus, O.....	" shipping coop.....	2 00
same	" brood coop.....	2 00
same	" exhibition coop.....	2 00
same	" marker.....	1 00
same	" collection of pure-bred poultry eggs, to be exhibited in trays.....	5 00

PIGEONS, ORNAMENTAL BIRDS AND PET STOCK.

Owner's name and address.	Best collection.	Premium.
H. F. Lakman, Cincinnati, O.....	Best collection of pigeons, not less than 50 specimens	\$30 00
Geo. Ewald, "	2d best collection of pigeons, not less than 50 specimens	15 00
H. A. Bridge, Columbus, O.....	Best collection of ornamental cage birds.....	30 00
Jas. Lindsey, Waller.....	2d "	15 00
same	Best collection of ornamental birds other than cage.....	10 00
O. E. Hemenway, New London, O.....	Best collection and greatest variety of pet stock	10 00
Jas. Lindsey, Waller.....	2d "	10 00
Chas. Gamberdinger, Columbus, O.....	Largest collection of poultry by one exhibitor	Medal.
S. E. Wurst, Elyria, O.....	2d "	Dip.
Jos. Farmer, Flushing, O.....	Best county collection of poultry	Medal.

ASIATICS.

Owner's name and address.	Kind of fowl.	Premium.
H. A. Bridge, Columbus, O.....	Best light Brahma cock.....	\$3 00
C. H. Ackery, Tonawanda, N. Y.....	2d "	1 00
same	Best light Brahma hen.....	3 00
H. A. Bridge, Columbus, O.....	2d "	1 00
Chas. Gamberdinger, Columbus, O.....	Best light Brahma cockerel.....	3 00
H. A. Bridge, Columbus, O.....	2d "	1 00
C. H. Ackery, Tonawanda, N. Y.....	Best light Brahma pullet	3 00
H. A. Bridge, Columbus, O.....	2d "	1 00
same	Light Brahma breeding pen.....	10 00
Chas. Gamberdinger, Columbus, O.....	2d "	5 00
H. A. Bridge, Columbus, O.....	Best breeding pen mated for cockerels.....	Medal.
same	" pullets	"
Chas. Gamberdinger, Columbus, O.....	Best dark Brahma cock.....	3
G. S. Singer, Cardington, O.....	2d "	1
Chas. Gamberdinger, Columbus, O.....	Best dark Brahma hen.....	3 00

ASIATICS—Continued.

Owner's name and address.	Kind of fowl.	Premium.
Chas. Gamberdinger, Columbus, O.....	2d best dark Brahma hen.....	\$1 00
same	Best dark Brahma cockerel.....	3 00
same	" " pullet.....	3 00
same	2d " ".....	1 00
same	Best dark Brahma breeding pen.....	10 00
T. F. McGrew, Jr., Springfield, O.....	" buff Cochín cock.....	3 00
same	2d " ".....	1 00
same	Best buff Cochín hen.....	3 00
same	2d " ".....	1 00
W. H. Chrisman, London, O.....	Best buff Cochín cockerel.....	3 00
T. F. McGrew, Jr., Springfield, O.....	2d " ".....	1 00
same	Best buff Cochín pullet.....	3 00
same	2d " ".....	1 00
W. H. Chrisman, London, O.....	2d " ".....	1 00
T. F. McGrew, Jr., Springfield, O.....	Buff Cochín breeding pen.....	10 00
same	2d " ".....	5 00
same	Best breeding pen mated for cockerel.....	Medal.
same	" " pullets.....	"
C. P. Dickerman, Mallet Creek, O.....	Best partridge Cochín cock.....	3 00
Geo. D. Corlies, Atlanta, O.....	2d " ".....	1 00
B. H. Lambers, Dayton, O.....	Best partridge Cochín hen.....	3 00
C. P. Dickerman, Mallet Creek, O.....	2d " ".....	1 00
B. H. Lambers, Dayton, O.....	Best partridge Cochín cockerel.....	3 00
J. T. Bull & Bro., Westerville, O.....	2d " ".....	1 00
C. E. Kraner, Columbus, O.....	Best partridge Cochín pullet.....	3 00
same	2d " ".....	1 00
C. P. Dickerman, Mallet Creek, O.....	Best partridge Cochín breeding pen.....	10 00
Geo. D. Corlies, Atlanta, O.....	2d " ".....	5 00
J. T. Bull & Bro., Westerville, O.....	Best breeding pen mated for cockerels.....	Medal.
C. E. Kraner, Columbus, O.....	" " pullets.....	"
W. H. Clark, Mechanicsburg, O.....	Best black Cochín hen.....	3 00
same	2d " ".....	1 00
W. S. Baker, ".....	Best black Cochín cockerel.....	3 00
W. H. Clark, ".....	2d " ".....	1 00
W. S. Baker, ".....	Best black Cochín pullet.....	3 00
W. H. Clark, ".....	2d " ".....	1 00
same	Best black Cochín breeding pen.....	10 00
W. S. Baker, ".....	2d " ".....	5 00
Chas. Gamberdinger, Columbus, O.....	Best white Cochín cock.....	3 00
T. F. McGrew, Jr., Springfield, O.....	2d " ".....	1 00
same	Best white Cochín hen.....	3 00
same	2d " ".....	1 00
Chas. Gamberdinger, Columbus, O.....	Best white Cochín cockerel.....	3 00
same	" " pullet.....	3 00
same	2d " ".....	1 00
T. F. McGrew, Jr., Springfield, O.....	Best white Cochín breeding pen.....	10 00
Chas. Gamberdinger, Columbus, O.....	2d " ".....	5 00
same	Best Langshan cock.....	2 00
T. F. McGrew, Jr., Springfield, O.....	" hen.....	3 00
Chas. Gamberdinger, Columbus, O.....	" cockerel.....	3 00
O. E. Hemenway, New London, O.....	2d best Langshan ".....	1 00
same	Best Langshan pullet.....	3 00
same	2d " ".....	1 00
same	Best Langshan breeding pen.....	10 00
Chas. Gamberdinger, Columbus, O.....	2d " ".....	5 00
O. E. Hemenway, New London, O.....	Best Langshan breeding pen m't'd for cockerels.....	Medal.

DORKINGS.

Owner's name and address.	Kind of fowl.	Premium.
S. E. Wurst, Elyria, O.....	Best white Dorking cock.....	\$3 00
same	" " hen.....	3 00
same	" " cockerel.....	3 00
same	" " pullet.....	3 00
E. H. Houghton, Cleveland, O.....	Best colored " cock.....	3 00

DORKINGS—Continued.

Owner's name and address.	Kind of fowl.	Premium.
E. H. Houghton, Cleveland, O.....	Best colored Dorking hen	\$3 00
same	2d	1 00
B. F. Bridge, New Morefield, O	Best colored Dorking cockerel.....	3 00
same	Best colored Dorking pullet.....	3 00
E. H. Houghton, Cleveland, O.....	Best breeding pen	3 00
S. E. Wurst, Elyria, O.....	Best silver gray Dorking cock.....	3 00
same	Best silver gray Dorking hen.....	3 00
B. F. Bridge, New Morefield, O.....	Best silver gray Dorking cockerel.....	3 00
same	Best silver gray Dorking pullet	3 00

HAMBURGS.

Owner's name and address.	Kind of fowl.	Premium.
C. W. McFarland, Iberia, O	Best silver spangled Hamburg cock.....	\$3 00
C. Gamerdinger, Columbus, O	2d	1 00
same	Best silver spangled Hamburg hen	3 00
C. W. McFarland, Iberia, O	2d	1 00
same	Best silver spangled Hamburg cockerel.....	3 00
C. Gamerdinger, Columbus, O	2d	1 00
C. W. McFarland, Iberia, O	Best silver spangled Hamburg pullet.....	3 00
W. S. Baker, Mechanicsburg, O.....	2d	1 00
C. Gamerdinger, Columbus, O	Best silver spangled Hamburg breeding pen ...	3 00
same	2d	4 00
same	Best breeding pen mated for cockerels	Medal.
S. E. Wurst, Elyria, O	Best golden spangled Hamburg cock	3 00
J. H. Cole, Berkshire, O.....	2d	1 00
S. E. Wurst, Elyria, Ohio.....	Golden spangled Hamburg hen.....	3 00
B. F. Bridge, New Morefield, O.....	Best golden spangled Hamburg cockerel	3 00
same	2d	1 00
same	Best golden spangled Hamburg pullet.....	3 00
same	Best golden spangled Hamburg breeding pen.....	3 00
J. A. Tinker, Cleveland, O.....	Best silver-pencilled Hamburg cock	3 00
S. E. Wurst, Elyria, O	2d	1 00
J. A. Tinker, Cleveland, O.....	Best silver-pencilled Hamburg hen	3 00
S. E. Wurst, Elyria, O	2d	1 00
same	Best silver-pencilled Hamburg cockerel.....	3 00
J. A. Tinker, Cleveland, O.....	2d	1 00
same	Best silver-pencilled Hamburg pullet.....	3 00
same	2d	1 00
J. A. Tinker, Cleveland, O.....	Best silver-pencilled Hamburg breeding pen.....	3 00
S. E. Wurst, Elyria, O	Golden-pencilled Hamburg cock	3 00
Mrs. F. A. Chapman, Wellington, O.....	Golden-pencilled Hamburg hen.....	3 00
same	2d	1 00
same	Golden-pencilled Hamburg cockerel	3 00
same	Golden-pencilled Hamburg breeding pen.....	3 00
S. E. Wurst, Elyria, O	Best black Hamburg hen.....	3 00
Jas. Lindsey, Waller, O	2d	1 00
S. E. Wurst, Elyria, O	Best black Hamburg cockerel	3 00
same	" black Hamburg pullet	3 00
same	" white Hamburg cock.....	3 00

SPANISH.

Owner's name and address.	Kind of fowl.	Premium.
S. E. Wurst, Elyria, O.....	White faced black Spanish cock.....	\$3 00
M. W. Househalter, Doylestown, O.....	2d	1 00
same	White faced black Spanish hen	3 00
C. Gamerdinger, Columbus, O.....	2d	1 00
same	Best white faced black Spanish cockerel	3 00
same	2d	1 00
same	Best white faced black Spanish pullet.....	3 00

SPANISH—Continued.

Owner's name and address.	Kind of fowl.	Premium.
M. W. Househalter, Doylestown, O.....	2d best white faced black Spanish pullet.....	\$1 00
C. G. Gerdinger, Columbus, O.....	W. F. B. Spanish breeding pen.....	3 00
S. E. Wurst, Elyria, O.....	Best S. C. white Leghorn cock.....	3 00
James Pace, Columbus, O.....	2d.....	1 00
Roy C. Russell, Mt. Gilead, O.....	Best S. C. white Leghorn hen.....	3 00
same.....	2d.....	1 00
S. E. Wurst, Elyria, O.....	Best S. C. white Leghorn cockerel.....	3 00
Roy C. Russell, Mt. Gilead, O.....	2d.....	1 00
same.....	Best S. C. white Leghorn pullet.....	3 00
S. E. Wurst, Elyria, O.....	2d.....	1 00
Roy C. Russell, Mt. Gilead, O.....	Best S. C. white Leghorn breeding pen.....	10 00
same.....	2d.....	5 00
same.....	Best S. C. white Leghorn pen, mated for cock- erels.....	Medal
same.....	2d best S. C. white Leghorn pen, mated for pullets.....	Medal
S. E. Wurst, Elyria, O.....	Best S. C. brown Leghorn hen.....	3 00
F. & R. Hedden, Columbus, O.....	2d.....	1 00
S. E. Wurst, Elyria, O.....	Best S. C. brown Leghorn cockerel.....	3 00
F. & R. Hedden, Columbus, O.....	2d.....	1 00
same.....	Best S. C. brown Leghorn pullet.....	3 00
same.....	2d.....	1 00
same.....	Best S. C. brown Leghorn breeding pen.....	10 00
same.....	Best breeding pen mated for cockerels.....	Medal
C. G. Gerdinger, Columbus, O.....	Best R. C. white Leghorn cock.....	3 00
same.....	2d.....	1 00
same.....	Best R. C. white Leghorn cockerel.....	3 00
same.....	2d.....	1 00
same.....	Best R. C. white Leghorn pullet.....	3 00
same.....	2d.....	1 00
same.....	Best R. C. white Leghorn.....	3 00
same.....	2d.....	1 00
same.....	R. C. white Leghorn breeding pen.....	10 00
same.....	Best R. C. brown Leghorn cockerel.....	3 00
same.....	Best R. C. brown Leghorn pullet.....	3 00
same.....	2d.....	1 00
same.....	R. C. brown Leghorn breeding pen.....	10 00
same.....	Best black Leghorn hen.....	3 00
same.....	2d.....	1 00
same.....	Best black Leghorn cockerel.....	3 00
S. E. Wurst, Elyria, O.....	2d.....	1 00
same.....	Best black Leghorn pullet.....	3 00
James Pace, Columbus, O.....	2d.....	1 00
C. G. Gerdinger, Columbus, O.....	Black Leghorn breeding pen.....	10 00
H. H. Hewitt, Williamsburg, Pa.....	Best Andalusian cock.....	3 00
G. L. Lake, Croton.....	Best Andalusian hen.....	3 00
H. H. Hewitt, Williamsburg, Pa.....	2d.....	1 00
G. L. Lake, Croton.....	Best Andalusian cockerel.....	3 00
same.....	2d.....	1 00
same.....	Best Andalusian pullet.....	3 00
same.....	2d.....	1 00
same.....	Best Andalusian breeding pen.....	8 00
same.....	Best black Minorca cock.....	3 00
H. A. Bridge, Columbus, O.....	2d.....	1 00
same.....	Best black Minorca hen.....	3 00
same.....	2d.....	1 00
A. A. Adams, Canonsburg, Pa.....	Best black Minorca cockerel.....	3 00
E. O. Grossman, Monroe, Mich.....	2d.....	1 00
A. A. Adams, Canonsburg, Pa.....	Best black Minorca pullet.....	3 00
E. O. Grossman, Monroe, Mich.....	2d.....	1 00
H. A. Bridge, Columbus, O.....	Black Minorca breeding pen.....	10 00
W. C. Barney, Cleveland, O.....	Best white Minorca cock.....	3 00
J. E. Gill, Franklin, Pa.....	Best white Minorca hen.....	3 00
H. H. Hewitt, Williamsburg, Pa.....	2d.....	1 00
W. C. Barney, Cleveland, O.....	Best white Minorca cockerel.....	3 00
H. H. Hewitt, Williamsburg, Pa.....	2d.....	1 00
same.....	Best white Minorca pullet.....	3 00
same.....	2d.....	1 00
W. C. Barney, Cleveland, O.....	Best white Minorca breeding pen.....	10 00
H. H. Hewitt, Williamsburg, Pa.....	2d.....	5 00

AWARDS.

III

POLISH.

Owner's name and address.	Kind of fowl.	Premium.
S. E. Wurst, Elyria, O.....	Bearded golden Polish cock	\$3 00
C. Gamberdinger, Columbus, O.....	2d	1 00
same	Best bearded golden Polish hen	3 00
S. E. Wurst, Elyria, O.....	2d	1 00
same	Best bearded silver Polish cock	3 00
C. Gamberdinger, Columbus, O.....	2d	1 00
S. E. Wurst, Elyria, O.....	Best bearded silver Polish cockerel	3 00
C. Gamberdinger, Columbus, O.....	2d	1 00
same	Best bearded silver Polish pullet.....	3 00
same	Bearded silver Polish breeding pen.....	8 00
same	2d	4 00
S. E. Wurst, Elyria, O.....	Pen mated for cockerels, breeding pen.....	Medal.
A. B. Seymour, Ravenna, O.....	Best white-crested black cock	3 00
C. Gamberdinger, Columbus, O.....	White-crested black hen.....	3 00
same	2d	1 00
same	White-crested black cockerel.....	3 00
same	2d	1 00
same	Best white-crested black pullet	3 00
same	2d	1 00
A. B. Seymour, Ravenna, O.....	White-crested black breeding pen	8 00
J. H. Cole, Berkshire, O.....	2d	4 00
G. S. Singer, Cardington, O.....	Best golden cock.....	3 00
H. A. Bridge, Columbus, O.....	" hen.....	3 00
same	" cockerel.....	3 00
same	" pullet.....	8 00
same	Best buff cockerel.....	3 00
same	" pullet	3 00
same	2d "	1 00

GAMES.

Owner's name and address.	Kind of fowl.	Premium.
S. E. Wurst, Elyria, O.....	Best black Game cock	\$3 00
same	2d	1 00
same	2d best brown-red Game cock	1 00
same	" hen.....	1 00
same	Best brown-red Game cockerel.....	3 00
same	" pullet	3 00
J. E. Gill, Franklin, Pa.....	Black-breasted red Game cock	3 00
same	2d	1 00
same	Black-breasted red Game hen	3 00
same	2d	1 00
same	Black-breasted red Game cockerel	3 00
same	2d	1 00
same	Black-breasted red Game pullet.....	3 00
same	2d	1 00
same	Best black-breasted red Game breeding pen.....	10 00
same	Best red pile Game cock.....	3 00
same	2d	1 00
same	Best red pile Game hen.....	3 00
same	2d	1 00
J. H. Northup, Cherry Creek, N. Y.....	Best red pile Game cockerel.....	3 00
J. E. Gill, Franklin, Pa.....	2d	1 00
same	Best red pile Game pullet	3 00
J. H. Northup, Cherry Creek, N. Y.....	2d	1 00
S. E. Wurst, Elyria, O.....	Silver duck-wing Game cock.....	3 00
J. E. Gill, Franklin, Pa.....	" hen.....	3 00
S. E. Wurst, Elyria, O.....	2d	1 00
same	Silver duck-wing Game cockerel.....	3 00
same	" pullet	3 00
same	Yellow duck-wing Game hen	3 00
J. E. Gill, Franklin, Pa.....	" cockerel	3 00
S. E. Wurst, Elyria, O.....	2d	1 00
same	" pullet	1 00
same	" cock	1 00

GAMES—Continued.

Owner's name and address.	Kind of fowl.	Premium.
J. E. Gill, Franklin, Pa.....	Best white Game hen.....	\$2 00
S. E. Wurst, Elyria, O.....	2d " ".....	1 00
same	Best white Game pullet.....	3 00
J. D. Luce, Urbana, O.....	Best Sumatra Game cock.....	3 00
J. H. Northup, Cherry Creek, N. Y.....	2d " ".....	1 00
J. D. Luce, Urbana, O.....	Best Sumatra Game hen.....	3 00
J. H. Northup, Cherry Creek, N. Y.....	2d " ".....	1 00
J. D. Luce, Urbana, O.....	Best Sumatra Game cockerel.....	3 00
C. Gamerdinger, Columbus, O.....	2d " ".....	1 00
J. D. Luce, Urbana, O.....	Best Sumatra Game pullet.....	3 00
C. Gamerdinger, Columbus, O.....	2d " ".....	1 00
Geo. Baker, Columbus, O.....	Best pit Game cock.....	3 00
same	" hen.....	3 00
same	" cockerel.....	3 00
same	" pullet.....	3 00

FRENCH.

Owner's name and address.	Kind of fowl.	Premium.
C. Gamerdinger, Columbus, O.....	Best Houdan cock.....	\$3 00
A. D. Olin, Streetsboro, O.....	2d " ".....	1 00
same	Best Houdan hen.....	3 00
C. Gamerdinger, Columbus, O.....	2d " ".....	1 00
G. S. Singer, Cardington, O.....	Best Houdan cockerel.....	3 00
S. E. Wurst, Elyria, O.....	2d " ".....	1 00
C. Gamerdinger, Columbus, O.....	Best Houdan pullet.....	3 00
same	2d " ".....	1 00
same	Houdan breeding pen.....	10 00
A. D. Olin, Streetsboro, O.....	2d " ".....	5 00
C. Gamerdinger, Columbus, O.....	Best Crevecoeur cock.....	3 00
same	" hen.....	3 00
same	2d " ".....	1 00
S. E. Wurst, Elyria, O.....	Best Crevecoeur cockerel.....	3 00
C. Gamerdinger, Columbus, O.....	2d " ".....	1 00
same	Best " pullet.....	3 00
S. E. Wurst, Elyria, O.....	2d " ".....	1 00

AMERICAN.

Owner's name and address.	Kind of fowl.	Premium.
Perley Pickett, Barnesville, O.....	Best Plymouth Rock cock.....	\$3 00
H. A. Bridge, Columbus, O.....	2d " ".....	1 00
Perley Pickett, Barnesville, O.....	Best Plymouth Rock hen.....	3 00
same	2d " ".....	1 00
same	Best Plymouth Rock cockerel.....	3 00
H. A. Bridge, Columbus, O.....	2d " ".....	1 00
same	Best Plymouth Rock pullet.....	3 00
Perley Pickett, Barnesville, O.....	2d " ".....	1 00
H. A. Bridge, Columbus, O.....	Plymouth Rock breeding pen.....	10 00
Perley Pickett, Barnesville, O.....	2d " ".....	5 00
H. A. Bridge, Columbus, O.....	Breeding pen, mated for cockerels.....	Medal
Perley Pickett, Barnesville, O.....	" pullets.....	"
J. E. Gill, Franklin, O.....	White Plymouth Rock cock.....	3 00
W. W. Stuckey, London, O.....	2d " ".....	1 00
same	White Plymouth Rock hen.....	3 00

AWARDS.

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AMERICAN—Continued.

Owner's name and address.	Kind of fowl.	Premium.
Joe Farmer, Flushing, O.....	White Plymouth Rock cockerel.....	\$3 00
E. Davis, Toledo, O.....	2d ".....	1 00
Joe Farmer, Flushing, O.....	White Plymouth Rock pullet.....	3 00
E. Davis, Toledo, O.....	2d ".....	1 00
W. W. Stuckey, London, O.....	Best Dominique cock.....	3 00
W. C. Cooper, Columbus, O.....	" hen.....	3 00
same.....	2d ".....	1 00
same.....	Best Dominique cockerel.....	3 00
same.....	2d ".....	1 00
same.....	Best Dominique pullet.....	3 00
same.....	2d ".....	1 00
same.....	Dominique breeding pen.....	10 00
H. Turk, Elmwood Place, O.....	Best black Java cock.....	3 00
same.....	" hen.....	3 00
same.....	2d ".....	1 00
same.....	Best black Java cockerel.....	3 00
S. E. Wurst, Elyria, O.....	2d ".....	1 00
H. Turk, Elmwood Place, O.....	Best black Java pullet.....	3 00
same.....	2d ".....	1 00
same.....	Black Java breeding pen.....	10 00
Z. M. Masters, Jacobsburg, O.....	Best mottled Java cock.....	3 00
same.....	" hen.....	3 00
same.....	2d ".....	1 00
L. M. Bell, Croton, O.....	Best mottled Java cockerel.....	3 00
Z. M. Masters, Jacobsburg, O.....	" pullet.....	3 00
L. M. Bell, Croton, O.....	2d ".....	1 00
Z. M. Masters, Jacobsburg, O.....	Mottled Java breeding pen.....	10 00
J. R. McNary, Burgettstown, Pa.....	Best white Java cock.....	3 00
same.....	" hen.....	3 00
same.....	" cockerel.....	3 00
same.....	" pullet.....	3 00
H. A. Bridge, Columbus, O.....	Best silver Wyandotte cock.....	3 00
C. Gamberdinger, Columbus, O.....	2d ".....	1 00
H. A. Bridge, Columbus, O.....	Best silver Wyandotte hen.....	3 00
same.....	2d ".....	1 00
same.....	Best silver Wyandotte cockerel.....	3 00
A. Price, Compher, O.....	2d ".....	1 00
W. J. Braklow, Ravenna, O.....	Best silver Wyandotte pullet.....	3 00
H. A. Bridge, Columbus, O.....	2d ".....	1 00
same.....	Silver Wyandotte breeding pen.....	10 00
C. Gamberdinger, Columbus, O.....	2d ".....	5 00
H. A. Bridge, Columbus, O.....	Breeding pen, mated for cockerels.....	Medal.
same.....	" pullets.....	Medal.
J. F. Skees, Rochester, O.....	Best white Wyandotte cock.....	3 00
same.....	" hen.....	3 00
same.....	2d ".....	1 00
same.....	Best white Wyandotte cockerel.....	3 00
W. S. Pollock, Mt. Gilead, O.....	2d ".....	1 00
J. F. Skees, Rochester, O.....	Best white Wyandotte pullet.....	3 00
same.....	2d ".....	1 00
same.....	White Wyandotte breeding pen.....	10 00
Ira C. Keller, Tiffin, O.....	Best golden Wyandotte cock.....	3 00
same.....	2d ".....	1 00
same.....	Best golden Wyandotte hen.....	3 00
same.....	2d ".....	1 00
same.....	Best golden Wyandotte cockerel.....	3 00
same.....	2d ".....	1 00
same.....	Best golden Wyandotte pullet.....	3 00
same.....	2d ".....	1 00
same.....	Golden Wyandotte breeding pen.....	10 00
same.....	2d ".....	5 00
same.....	Breeding pen, mated for cockerels.....	Medal.
F. N. Clemans, Jr., Mechanicsburg, O.....	Best black Wyandotte cockerel.....	.....
Ira C. Keller, Tiffin, O.....	2d ".....	.....
F. N. Clemans, Jr., Mechanicsburg, O.....	Best black Wyandotte hen.....	.....
Ira C. Keller, Tiffin, O.....	2d ".....	.....
F. N. Clemans, Jr., Mechanicsburg, O.....	Best black Wyandotte pullet.....	.....
same.....	2d ".....	.....
Ira C. Keller, Tiffin, O.....	Best black Wyandotte cock.....	.....
F. N. Clemans, Jr., Mechanicsburg, O.....	" breeding pen.....	.....
Ira C. Keller, Tiffin, O.....	2d ".....	.....
F. N. Clemans, Jr., Mechanicsburg, O.....	Best black Wyandotte breeding pen mated for cockerels.....	.....
E. Gill, Franklin, Pa.....	White Game Bantam hen.....	2 00
same.....	2d ".....	1 00
same.....	White Game Bantam pullet.....	2 00
S. E. Wurst, Elyria, O.....	Brown-red Game Bantam cock.....	2 00

AMERICAN—Continued.

Owner's name and address.	Kind of fowl.	Premium.
S. E. Wurst, Elyria, O.....	Brown-red Game Bantam hen.....	\$2 00
same	" " cockerel.....	2 00
J. E. Gill, Franklin, Pa.....	Best brown-red Game Bantam cock.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
J. E. Gill, Franklin, Pa.....	Best brown-red Game Bantam hen.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
J. E. Gill, Franklin, Pa.....	Best brown-red Game Bantam cockerel.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
J. E. Gill, Franklin, Pa.....	Best brown-red Game Bantam pullet.....	2 00
same	2d " " ".....	1 00
F. & R. Hedden, Columbus, O.....	Silver duck-wing Game Bantam cock.....	2 00
J. E. Gill, Franklin, Pa.....	2d " " ".....	1 00
F. & R. Hedden, Columbus, O.....	Silver duck-wing Game Bantam hen.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
F. & R. Hedden, Columbus, O.....	Silver duck-wing Game Bantam cockerel.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
F. & R. Hedden, Columbus, O.....	Silver duck-wing Game Bantam pullet.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
same	Golden duck-wing Game Bantam cock.....	2 00
same	" " " hen.....	2 00
same	" " " cockerel.....	2 00
J. H. Cole, Berkshire, O.....	White booted Bantam cock.....	2 00
same	" " " hen.....	2 00
W. S. Pollock, Mt. Gilead, O.....	Golden seabright Bantam cock.....	2 00
C. Gamerdinger, Columbus, O.....	2d " " ".....	1 00
James Lindsay, Waller, O.....	Golden seabright Bantam hen.....	2 00
C. Gamerdinger, Columbus, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Golden seabright Bantam cockerel.....	2 00
C. Gamerdinger, Columbus, O.....	2d " " ".....	1 00
same	Golden seabright Bantam pullet.....	2 00
W. S. Pollock, Mt. Gilead, O.....	2d " " ".....	1 00
C. Kraner, Columbus, O.....	Silver seabright Bantam cock.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
same	Silver seabright Bantam hen.....	2 00
C. Kraner, Columbus, O.....	2d " " ".....	1 00
J. F. Skees, Rochester, O.....	Silver seabright Bantam cockerel.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
C. Kraner, Columbus, O.....	Silver seabright Bantam pullet.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
same	Japanese Bantam cockerel.....	2 00
J. F. Skees, Rochester, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Japanese Bantam pullet.....	2 00
same	Pekin Bantam cock.....	2 00
J. F. Skees, Rochester, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Pekin Bantam hen.....	2 00
J. F. Skees, Rochester, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Pekin Bantam cockerel.....	2 00
G. S. Singer, Cardington, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Pekin Bantam pullet.....	2 00
G. S. Singer, Cardington, O.....	2d " " ".....	1 00
J. E. Gill, Franklin, Pa.....	Red-cap white Bantam cock.....	2 00
same	2d " " ".....	1 00
same	Red-cap white Bantam hen.....	2 00
same	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Red cap white Bantam cockerel.....	2 00
J. F. Skees, Rochester, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Red-cap white Bantam pullet.....	2 00
J. F. Skees, Rochester, O.....	2d " " ".....	1 00
same	Red-cap black Bantam cock.....	2 00
S. E. Wurst, Elyria, O.....	2d " " ".....	1 00
same	Red-cap black Bantam hen.....	2 00
J. E. Gill, Franklin, Pa.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Red-cap black Bantam cockerel.....	2 00
J. F. Skees, Rochester, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	Red-cap black Bantam pullet.....	2 00
J. F. Skees, Rochester, O.....	2d " " ".....	1 00
S. E. Wurst, Elyria, O.....	White-cap black Polish Bantam cock.....	2 00

AWARDS.

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MISCELLANEOUS.

Owner's name and address.	Kind of fowl.	Premium.
J. Stevens, Decorah, Iowa.....	Best black Russian cock.....	\$3 00
same.....	" " hen.....	3 00
same.....	" " cockerel.....	3 00
same.....	" " pullet.....	3 00
H. H. Hewitt, Williamsburgh, Pa.....	Best red-cap cock.....	3 00
same.....	2d.....	1 00
A. A. Adams, Cannonsburgh, Pa.....	Best red-cap hen.....	3 00
H. H. Hewitt, Williamsburgh, Pa.....	2d.....	1 00
J. E. Young, Newark, O.....	Best red-cap cockerel.....	3 00
A. A. Adams, Cannonsburgh, Pa.....	2d " ".....	1 00
J. E. Young, Newark, O.....	Best red-cap pullet.....	3 00
A. A. Adams, Cannonsburgh, Pa.....	2d.....	1 00
same.....	Red-cap breeding pen.....	10 00
H. H. Hewitt, Williamsburgh, Pa.....	2d.....	5 00
S. E. Wurst, Elyria, O.....	Best white Guinea cock.....	2 00
C. P. Dickerman, Mallet Creek, O.....	2d " ".....	1 00
same.....	Best white Guinea hen.....	2 00
J. H. Cole, Berkshire, O.....	2d " ".....	1 00
S. E. Wurst, Elyria, O.....	Best pearl Guinea cock.....	2 00
same.....	" " hen.....	2 00

TURKEYS.

Owner's name and address.	Kind of fowl.	Premium.
H. H. Sibbitt, Ripleyville, O.....	Best old pair bronze turkeys.....	\$5 00
H. H. Hewitt, Williamsburgh, Pa.....	2d " ".....	2 00
J. F. Barbee, Millersburgh, Ky.....	Best young pair bronze turkeys.....	5 00
H. H. Sibbitt, Ripleyville, O.....	2d " ".....	2 00
S. E. Wurst, Elyria, O.....	Best old pair black turkeys.....	5 00
J. H. Cole, Berkshire, O.....	2d " ".....	2 00
S. E. Wurst, Elyria, O.....	Best old pair white turkeys.....	5 00
same.....	2d " ".....	2 00
J. F. Barbee, Millersburgh, O.....	Best young pair white turkeys.....	5 00
A. Benedict, Bennington, O.....	" old pair wild turkeys.....	5 00
same.....	" young pair wild turkeys.....	5 00
S. E. Wurst, Elyria, O.....	" old pair Honduras turkeys.....	5 00
J. F. Barbee, Millersburgh, Ky.....	Young pair Naragansett turkeys.....	5 00

DUCKS.

Owner's name and address.	Kind of fowl.	Premium.
James Lindsey.....	Aylesburg ducks—young pair.....	\$5 00
H. H. Sibbitt, Ripleyville, O.....	Pekin ducks—old pair.....	5 00
C. P. Dickerman, Mallet Creek, O.....	2d " ".....	2 00
same.....	Pekin ducks—young pair.....	5 00
H. H. Sibbitt, Ripleyville, O.....	2d " ".....	2 00
same.....	Rouen ducks—old pair.....	5 00
S. E. Wurst, Elyria, O.....	2d.....	2 00
Chas. Gamberdinger, Columbus, O.....	Cayuga ducks—young pair.....	5 00
same.....	2d.....	2 00
W. A. Shafer, Middletown, O.....	Gray Call ducks—old pair.....	5 00
H. H. Sibbitt, Ripleyville, O.....	2d " ".....	2 00
same.....	Gray Call ducks—young pair.....	5 00
W. A. Shafer, Middletown, O.....	White Call ducks—old pair.....	5 00
S. E. Wurst, Elyria, O.....	" " young pair.....	5 00
H. H. Hewitt, Williamsburgh, Pa.....	Crested white ducks—old pair.....	5 00
J. H. Cole, Berkshire, O.....	2d " ".....	2 00

DUCKS—Continued.

Owner's name and address.	Kind of fowl.	Premium.
H. H. Hewitt, Williamsburgh, Pa.....	Crested white ducks—young pair.....	\$5 00
S. E. Wurst, Elyria, O.....	White Muscovy ducks—old pair.....	5 00
same	2d "	2 00
same	Colored Muscovy ducks—old pair.....	5 00
J. Lindsey.....	2d "	2 00
S. E. Wurst, Elyria, O.....	Colored Muscovy ducks—young pair.....	5 00

GEESE.

Owner's name and address.	Kind of fowl.	Premium.
H. H. Sibbitt, Ripleyville, O.....	Embden geese—old pair.....	\$5 00
C. P. Dickerman, Mallet Creek, O.....	2d "	2 00
H. H. Sibbitt, Ripleyville, O.....	Embden geese—young pair.....	5 00
same	Toulouse geese—old pair.....	5 00
C. P. Dickerman, Mallet Creek, O.....	2d "	2 00
same	Toulouse geese—young pair.....	5 00
H. H. Sibbitt, Ripleyville, O.....	2d "	2 00
S. E. Wurst, Elyria, O.....	Brown China geese—old pair.....	5 00
C. P. Dickerman, Mallet Creek, O.....	" " young pair.....	5 00
S. E. Wurst, Elyria, O.....	White China geese—old pair.....	5 00
J. H. Cole, Berkshire, O.....	2d "	2 00
S. E. Wurst, Elyria, O.....	White China geese—young pair.....	5 00
C. P. Dickerman, Mallet Creek, O.....	2d "	2 00
J. H. Cole, Berkshire, O.....	Common geese—old pair.....	5 00
same	Wild geese—old pair.....	5 00

AGRICULTURE.

COUNTY COLLECTIVE EXHIBITS.

County.	Name of article.	Premium.
Wood county, Bowling Green, O.....	Best representative county exhibit of agricultural products	\$500 00
Licking county, Newark, O.....	2d best representative county exhibit of agricultural products.....	250 00
Union county, Marysville, O.....	3d best representative county exhibit of agricultural products.....	150 00
Marion county, Marion, O.....	4th best representative county exhibit of agricultural products.....	100 00

INDIVIDUAL EXHIBITS.

Owner's name and address.	Name of article.	Premium.
Whipps Bros., Marion, O.....	Best collection and greatest variety of agricultural products, not including vegetables	\$50 00
W. H. Covault, Casstown, O.....	2d best collection and greatest variety of agricultural products not including vegetables..	25 00
J. J. McMillen, Van Wert, O	3d best collection and greatest variety of agricultural products not including vegetables..	10 00
same	Best display and greatest variety of field corn in the ear.....	20 00
Whipps Bros., Marion, O.....	2d best display and greatest variety of field corn in the ear.....	15 00
same	Best display and greatest variety of sweet corn in the ear.....	15 00
Lewis Swickard, Westerville, O	2d best display and greatest variety of sweet corn in the ear.....	10 00
Whipps Bros., Marion, O.....	Best display and greatest variety of pop corn..	10 00
J. J. McMillen, Van Wert, O	2d	5 00
W. H. Covault, Casstown, O.....	Best display of cereals, to include wheat, rye, barley, etc.....	15 00
S. R. Holt, Worthington, O.....	Best display and greatest variety of grasses properly named and labeled	20 00
J. J. McMillen, Van Wert, O.....	2d best display and greatest variety of grasses properly named and labeled	10 00
Whipps Bros., Marion, O.....	Best display Ohio grown leaf tobacco.....	15 00
same	Best display and greatest variety of vegetables	50 00
Lewis Swickard, Westerville, O.....	2d	25 00
Whipps Bros., Marion, O.....	Best display and greatest variety of potatoes.....	25 00
Dr. H. Bease, Delaware, O.....	2d	15 00
W. H. Ortman, Hallsville, O	Best display and greatest variety of sweet potatoes.....	10 00
Whipps Bros., Marion, O	2d best display and greatest variety of sweet potatoes	5 00
same	Best display and greatest variety of onions.....	10 00
J. W. B. Yontsey, Troy, O	2d	5 00
Whipps Bros., Marion, O	Best display of tomatoes	10 00
Lewis Swickard, Westerville, O.....	2d	5 00
same	Best display of squashes and pumpkins.....	10 00
J. J. McMillen, Van Wert, O.....	2d	5 00
Lewis Swickard, Westerville, O.....	Best display of cabbages	10 00
Whipps Bros., Marion, O.....	" water melons	10 00
same	Best display of musk melons	10 00
J. J. McMillen, Van Wert, O	2d	5 00
Lewis Swickard, Westerville, O.....	Best and greatest variety roots.....	15 00
Whipps Bros., Marion, O.....	2d	8 00

FLOUR AND OTHER CEREAL MILL PRODUCTS.

Owner's name and address.	Name of article.	Premium.
Mrs. M. Poole, Reynoldsburg, O	Best three loaves domestic yeast bread	\$3.00
Mary Maxwell, Reynoldsburg, O	2d "	Dip. 2.00
Mrs. N. L. Smith, Lindenville, O	Best domestic corn bread	2.00
same	Best domestic rye bread	2.00
Mrs. M. Poole	2d "	Dip. 2.00
same	Best domestic brown bread	Dip. 2.00
Mary Maxwell, Reynoldsburg, O	2d " "	Dip. 2.00
same	Best domestic Graham bread	Dip. 2.00
Mrs. N. L. Smith, Lindenville, O	2d " "	Dip. 2.00
Belmont Co.	Best domestic raised biscuit	Dip. 2.00
Mary Maxwell, Reynoldsburg, O	2d " "	Dip. 2.00
Lewis Swickard, Westerville, O	Best domestic sponge cake	Dip. 2.00
Mary Maxwell, Reynoldsburg, O	2d " "	Dip. 2.00

EXHIBITION OF BUTTER AND CHEESE FROM DAIRY TEST.

Owner's name and address.	Name of article.	Premium.
N. L. Smith, Lindenville, O.....	Best package of butter, 10 lbs. or more, from farm, dairy or individual	\$20 00
Mrs. I. A. Founier, West Williamsfield, O.....	2d best package of butter, 10 lbs. or more, from farm, dairy or individual	10 00
A. L. Holman, Springfield, O	Best tub of creamery butter	20 00

BEES, HONEY, ETC., AND APIARIAN SUPPLIES.

Owner's name and address.	Name of article.	Premium.
A. S. Goodrich, Worthington, O	Best display of comb honey.....	\$25 00
C. E. Jones, Delaware, O.....	2d " " ".....	20 00
Dr. H. Besse, Delaware, O.....	3d " " ".....	10 00
N. C. Mason, Auburndale, O	Best display extracted honey	25 00
Elias Cole, Ashley, O.....	2d " " ".....	20 00
A. S. Goodrich, Worthington, O.....	3d " " ".....	15 00
E. E. Mason, Auburndale, O.....	Best sample of extracted honey, not less than 20 lbs., in best shape for retailing	5 00
N. C. Mason, "	2d best sample of extracted honey, not less than 20 lbs., in best shape for retailing.....	4 00
C. E. Jones, Delaware, O.....	3d best sample of extracted honey, not less than 20 lbs., in best shape for retailing.....	3 00
N. C. Mason, Auburndale, O.....	Best sample of comb honey, not less than 20 lbs., in best shape for retailing.....	5 00
E. Mason, "	2d best sample of comb honey, not less than 20 lbs., in best shape for retailing	4 00
Dr. H. Besse, Delaware, O	3d best sample of comb honey, not less than 20 lbs., in best shape for retailing.....	3 00
Dr. G. L. Tinker.....	Best colony of bees.....	10 00
C. E. Jones, Delaware, O	2d " " ".....	8 00
Elias Cole, Ashley, O.....	3d " " ".....	6 00
A. B. Mason, Auburndale, O	Best races of bees.....	10 00
C. E. Jones, Delaware, O.....	2d " " ".....	8 00
Dr. G. L. Tinker	3d " " ".....	6 00
N. C. Mason, Auburndale, O.....	Best collection honey producing plants	15 00
E. E. Mason, "	2d " " ".....	10 00
A. B. Mason, "	3d " " ".....	5 00
O. S. Goodrich, Worthington, O	Best display of beeswax.....	8 00
Dr. H. Besse, Delaware, O.....	2d " " ".....	6 00

BEES, HONEY, ETC., AND APIARIAN SUPPLIES—Continued.

Owner's name and address.	Name of article.	Premium.
Elias Cole, Ashley, O.....	3d best display of beeswax.....	\$4 00
same.....	Best foundation mill.....	6 00
Dr. H. Besse, Delaware, O.....	2d ".....	5 00
A. B. Mason, Auburndale, O.....	Best foundation press.....	6 00
same.....	Best foundation for a brood chamber made on the grounds.....	4 00
N. C. Mason, ".....	2d best foundation for a brood chamber made on the grounds.....	3 00
A. B. Mason, ".....	Best foundation for surplus made on grounds..	4 00
N. C. Mason, ".....	2d ".....	3 00
Elias Cole, Ashley, O.....	Best foundation of surplus of not less than 10 pounds.....	3 00
same.....	Best foundation for brood chamber not less than 15 pounds.....	3 00
N. C. Mason, Auburndale, O.....	Best honey cake, with receipt.....	3 00
E. E. Mason, ".....	2d ".....	2 00
N. C. Mason, ".....	Best honey cookies, with receipt.....	3 00
E. E. Mason, ".....	2d ".....	2 00
N. C. Mason, ".....	Best honey jumbles.....	3 00
E. E. Mason, ".....	2d ".....	2 00
N. C. Mason, ".....	Best honey candles.....	5 00
E. E. Mason, ".....	2d ".....	3 00
A. B. Mason, ".....	Best honey vinegar, not less than five gallons, displayed in glass.....	4 00
O. S. Goodrich, Worthington, O.....	2d best honey vinegar, not less than 5 gallons, displayed in glass.....	3 00
N. C. Mason, Auburndale, O.....	Best display of queens.....	4 00
C. E. Jones, Delaware, O.....	2d ".....	3 00
Elias Cole, Ashley, O.....	3d ".....	2 00
A. B. Mason, Auburndale, O.....	Best honey extractor.....	5 00
C. E. Jones, Delaware, O.....	d ".....	4 00
Dr. H. Besse, ".....	3d ".....	3 00
Elias Cole, Ashley, O.....	Best wax extractor.....	3 00
C. E. Jones, Delaware, O.....	2d ".....	2 00
Dr. H. Besse, ".....	3d ".....	1 00
Dr. G. L. Tinker.....	Best bee-hive for all purposes.....	4 00
A. B. Mason, Auburndale, O.....	2d ".....	3 00
Elias Cole, Ashley, O.....	3d ".....	2 00
Dr. G. L. Tinker.....	Best bee-hive exhibition.....	3 00
A. B. Mason, Auburndale, O.....	2d ".....	2 00
Dr. H. Besse, Delaware, O.....	Best bee smoker.....	3 00
C. E. Jones, ".....	2d ".....	2 00
Dr. G. L. Tinker.....	Best arrangement for securing surplus honey..	3 00
C. E. Jones, Delaware, O.....	2d ".....	2 00
Dr. G. L. Tinker.....	Best sections for comb honey, not less than 50 pounds.....	2 00
Dr. H. Besse, Delaware, O.....	2d best sections for comb honey, not less than 50 pounds.....	1 00
Dr. G. L. Tinker.....	Best apiarian supplies, etc.....	8 00
Dr. H. Besse, Delaware, O.....	d ".....	6 00
A. B. Mason, Auburndale, O.....	3d ".....	5 00

COUNTY COLLECTIVE EXHIBITS—MEDALS RECOMMENDED.

County.	Name.	Premium.
Van Wert county, Van Wert, O.....	T. S. Gilliland.....	Medal.
Loraine county, Elyria, O.....	B. R. Herrick.....	"
Ross county, Chillicothe, O.....	".....	"
Stark county, Marlboro, O.....	Nieswanger.....	"
Hamilton county, Glendale, O.....	E. C. Ellis.....	"
Madison county, London, O.....	".....	"
Miami county, Troy, O.....	".....	"
Montgomery county, Dayton, O.....	".....	"
Belmont county, St. Clairsville, O.....	McKelvey.....	"
Franklin county, Columbus, O.....	".....	"
Wayne county, Wooster, Ohio.....	".....	"
Clarke county, Springfield, O.....	".....	"

HORTICULTURE.

FIRST EXAMINATION.

SUMMER AND FALL APPLES.

Owner's name and address.	Name of article.	Premium.
J. G. Bilderback, Millersburgh, O.....	Best approved new variety.....	\$2 00
same	Three varieties, size and beauty.....	2 00
W. H. West, Chillicothe, O.....	2d ".....	1 00
J. G. Bilderback, Millersburgh, O.....	Three varieties, market.....	2 00
J. J. McMillen, Van Wert, O.....	2d ".....	1 00
J. G. Bilderback, Millersburgh, O.....	Variety of summer dessert.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
F. H. Johnson, Musselman, O.....	Variety of fall dessert.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
J. J. McMillen, Van Wert, O.....	1/2 bushel basket six varieties.....	3 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	3 00
J. J. McMillen, Van Wert, O.....	Display 10 varieties.....	3 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	2 00
J. G. Bilderback, Millersburgh, O.....	Display 15 varieties.....	5 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	3 00
J. G. Bilderback, Millersburgh, O.....	Display 20 varieties.....	6 00
Jas. Dunipace, Perrysburgh, O.....	3d ".....	4 00

PLATE APPLES—SUMMER AND FALL.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best Duchess of Oldenburg.....	\$1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
Grant Dresbach, Hallsville, O.....	Best Fall Pippin.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
same	Best Fall Wine.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Gravenstein.....	1 00
J. S. Marcellus, Zanesville, O.....	2d ".....	50
same	Best Ohio Nonpareil.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
P. Hinton, Hallsville, O.....	Best Western Beauty.....	1 00
Adam G. Smith, Chillicothe, O.....	2d ".....	50
S. J. & S. R. Moore, Zanesville, O.....	Best Benoni.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
Wm. Wallace.....	Best Maiden's Blush.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
Jas. Dunipace, Perrysburgh, O.....	Best Early Harvest.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
same	Best Red Astrachan.....	1 00
J. S. Marcellus, Zanesville, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Chenango Strawberry.....	1 00
Isaac Freeman, Rex, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	Best Lowell.....	1 00
D. O. Frantz, Springfield, O.....	2d ".....	50
J. S. Marcellus, Zanesville, O.....	Best Summer Quinn.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
S. H. Hurst, Chillicothe, O.....	Best Buckingham.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	Best Porter.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
same	Best Cooper's Market.....	1 00
Wm. Ashworth, Kingston, O.....	Best Calvert.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
S. H. Hurst, ".....	Best Beauty of Kent.....	1 00

PLATE APPLES—SUMMER AND FALL—Continued.

Owner's name and address.	Name of article.	Premium.
J. F. Bowman, Forgry, O.....	Best Flora	\$1
Thomas Fulton, Frankfort, O.....	2d "	
Wm. Ashworth, Kingston, O.....	Best Golden Pippin.....	1
S. H. Hurst, Chillicothe, O.....	2d "	50
J. G. Bilderback, Millersburgh, O.....	Best Yellow Transparent.....	1 00

PLATE APPLES—WINTER.

Owner's name and address.	Name of article.	Premium.
Daniel Duer, Millersburgh, O.....	Best Baldwin	\$1 00
J. F. Bowman, Forgry, O.....	2d "	50
A. Rapstalk, Hallsville, O.....	Best Yellow Belleflower	1 00
Jos. Zipper, Chillicothe, O.....	2d "	50
James Dunipace, Perrysburgh, O.....	Best Belmont	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
J. B. Reason, Laurelvilleville, O.....	Best Ben Davis.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d "	50
Hurst & Hurst, Chillicothe, O.....	Best Ortley.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d "	50
Isaac Freemau, Rex, O.....	Best Haas.....	1 00
J. F. Bowman, Forgry, O.....	2d "	50
Daniel Duer, Laurelvilleville, O.....	Best Fallawater.....	1 00
S. H. Hurst, Chillicothe, O.....	2d "	50
Colena Long, Hallsville, O.....	Best Grime's Golden	1 00
Hurst & Hurst, Chillicothe, O.....	2d "	50
J. S. Marcellus, Zanesville, O.....	Hubbardson's Nonesuch.....	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
J. B. Reason, Laurelvilleville, O.....	Best Jonathan	1 00
W. H. West, Chillicothe, O.....	2d "	50
Henry Long, Adelphi, O.....	Best King of Tompkin's County.....	1 00
Daniel Duer, Millersburgh, O.....	2d "	50
S. J. & S. R. Moore, Zanesville, O.....	Best Northern Spy.....	1 00
Wm. Ashworth, Kingston, O.....	2d "	50
Hurst & Hurst, Chillicothe, O.....	Best Peck's Pleasant.....	1 00
Daniel Duer, Millersburgh, O.....	2d "	50
same	Best Red Canada.....	1 00
W. H. Innis, Columbus, O.....	2d "	50
Daniel Duer, Millersburgh, O.....	Best Rambo.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Best Rhode Island Greening	1 00
L. Buchwalter, Hallsville, O.....	2d "	50
Nelson Cox, Bradrick, O.....	Best Rome Beauty.....	1 00
Grant Dresbach, Hallsville, O.....	3d "	50
Hurst & Hurst, Chillicothe, O.....	Best Roxbury Russet	1 00
Nelson Cox, Bradrick, O.....	2d "	50
J. B. Reason, Laurelvilleville, O.....	Best Smith's Cider.....	1 00
H. Bookwalter, Hallsville, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Best Twenty Ounce.....	1 00
Daniel Duer, Millersburgh, O.....	2d "	50
J. B. Reason, Laurelvilleville, O.....	Best White Pippin.....	1 00
S. H. Hurst, Chillicothe, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Best Stark.....	1 00
F. P. Dill, Westerville, O.....	2d "	50
J. F. Bowman, Forgry, O.....	Best Wagner	1 00
Hurst & Hurst, Chillicothe, O.....	2d "	50
same	Best Newton Spitzenburg	1 00
L. Buchwalter, Hallsville, O.....	2d "	50
H. Bookwalter, "	Best American Golden Russet.....	1 00
E. Pontius, "	2d "	50
Wm. Strawser, Adelphi, O.....	Best Limber Twig	1 00
J. S. Marcellus, Zanesville, O.....	Best Willow Twig	1 00
P. Hinton, Hallsville, O.....	2d "	50
W. H. West, Chillicothe, O.....	Best Paradise Winter Sweet	1 00
J. F. Bowman, Forgry, O.....	2d "	50
Daniel Duer, Millersburgh, O.....	Best Smokehouse	00
Jas. Dunipace, Perrysburgh, O.....	2d "	00

PLATE APPLES—WINTER—Continued.

Owner's name and address.	Name of article.	Premium.
J. F. Bowman, Forgy, O.	Best Wealthy	\$1 00
Isaac Freeman, Rex, O.	2d	50
Wm. Strawser, Adelphi, O.	Best Fink	1 00
L. Buchwalter, Hallsville, O.	2d	50
Adam G. Schmidt, Chillicothe, O.	Best Wine Sap	1 00
Andrew Sniff, Kingston, O.	2d	50
Hurst & Hurst, Chillicothe, O.	Best Roman Stem	1 00
Daniel Duer, Millersburgh, O.	2d	50
Nelson Cox, Bradrick, O.	Best Romanite	1 00
Hurst & Hurst, Chillicothe, O.	2d	50
Grant Dresbach, Hallsville, O.	Best Newton Pippin	1 00
F. P. Dill, Westerville, O.	2d	50
Nelson Cox, Bradrick, O.	Best Black Gillflower	1 00
Daniel Duer, Millersburgh, O.	2d	50
Mrs. Josh. Seney, Chillicothe, O.	Best Penn. Redstreak	1 00
J. B. Reason, Laurelville, O.	2d	50
H. Bookwalter, Hallsville, O.	Best Lady Apple	1 00
Daniel Duer, Millersburgh, O.	2d	50
Isaac Freeman, Rex, O.	Best Milan	1 00
Wm. Ashworth, Kingston, O.	2d	50
J. S. Marcellus, Zanesville, O.	Best Fameuse or Snow	1 00
Hurst & Hurst, Chillicothe, O.	2d	50
Daniel Duer, Millersburgh, O.	Best Detroit Red	1 00
D. O. Frantz, Springfield, O.	2d	50
Mrs. Rudle, Hallsville, O.	Best English Russet	1 00
Daniel Duer, Millersburgh, O.	2d	50
same	Best Esopus Spitzenburg	1 00
Nelson Cox, Bradrick, O.	Best Rawle's Janet	1 00
W. H. Innis, Columbus, O.	2d	50
Andrew Sniff, Kingston, O.	Best Prior's Red	1 00
Nelson Cox, Bradrick, O.	2d	50
Daniel Duer, Millersburgh, O.	Best Bailey's Sweet	1 00
H. C. Bateham, Painesville, O.	2d	50
W. W. Farnsworth, Waterville, O.	Best Mother Apple	1 00
E. G. Stockman, Prospect, O.	Best Mann	1 00
J. F. Bowman, Forgy, O.	Best Pewawkee	1 00
E. G. Stockman, Prospect, O.	2d	50
H. C. Bateham, Painesville, O.	Best Ribston Pippin	1 00
W. H. West, Chillicothe, O.	Best St. Lawrence	1 00
Daniel Duer, Millersburgh, O.	2d	50
Hurst & Hurst, Chillicothe, O.	Best Talman Sweet	1 00
W. W. Farnsworth, Waterville, O.	2d	50
same	Westfield Seek-no-Further	1 00
F. P. Dill, Westerville, O.	2d	50
Daniel Duer, Millersburgh, O.	Best York Imperial	1 00
J. F. Bowman, Forgy, O.	Best Walbridge	1 00

WINTER APPLES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
J. F. Bowman, Forgy, O.	Best new variety	\$2 00
Daniel Duer, Millersburgh, O.	Five varieties, quality and profit	2 00
S. J. & S. R. Moore, Zanesville, O.	2d	1 00
Jas. Dunipace, Perrysburgh, O.	Ten varieties, quality and profit	3 00
Hurst & Hurst, Chillicothe, O.	2d	2 00
J. J. McMillen, Van Wert, O.	Fifteen varieties	5 00
Hurst & Hurst, Chillicothe, O.	2d	3 00
same	Five varieties—size and beauty	2 00
Jas. Dunipace, Perrysburgh, O.	2d	1 00
W. W. Farnsworth, Waterville, O.	Variety dessert	1 00
Hurst & Hurst, Chillicothe, O.	2d	50
F. P. Dill, Westerville, O.	Best 3 varieties dessert	2 00
S. J. & S. R. Moore, Zanesville, O.	2d	1 00
Jas. Dunipace, Perrysburgh, O.	Six varieties, profit to rule	2 00
Grant Dresbach, Hallsville, O.	2d	1 00
Jas. Dunipace, Perrysburgh, O.	One-half bushel basket 10 varieties	3 00

WINTER APPLES—IN VARIETY—Continued.

Owner's name and address.	Name of article.	Premium.
S. J. & S. R. Moore, Zanesville, O.....	2d $\frac{1}{2}$ bushel basket 10 varieties.....	\$2 00
Daniel Duer, Millersburgh, O.....	Best 20 varieties.....	5 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	3 00
Daniel Duer, Millersburgh, O.....	Best display 30 varieties.....	6 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	4 00

CRAB APPLES.

Owner's name and address.	Name of article.	Premium.
Fred. C. Brant, Chillicothe, O.....	Best Transcendent.....	\$1 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	50
H. Bookwalter, Hallsville, O.....	Best Hyslop.....	1 00
J. F. Bowman, Forgy, O.....	2d ".....	50
H. Bookwalter, Hallsville, O.....	Best Quaker Beauty.....	1 00
Isaac Freeman, Rex, O.....	Best Whitney's No. 20.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Best collection of crabs.....	2 00
W. W. Farnsworth, Waterville, O.....	2d ".....	1 00

PEARS—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
J. H. Britton, Painesville, O.....	Six varieties summer and fall.....	\$2 00
Isaac Freeman, Rex, O.....	2d ".....	1 00
J. H. Britton, Painesville, O.....	Twelve varieties summer and fall.....	3 00
B. E. Poste, Columbus, O.....	2d ".....	2 00
Jacob Linxweiler, Dayton, O.....	Three plates large, size and beauty.....	1 50
J. H. Britton, Painesville, O.....	2d ".....	1 00
Jas. Dunipace, Perrysburgh, O.....	Three varieties market, profit.....	1 50
J. H. Britton, Painesville, O.....	2d ".....	1 00
Jas. Dunipace, Perrysburgh, O.....	Three varieties dessert.....	1 50
Isaac Freeman, Rex, O.....	2d ".....	1 00
J. H. Britton, Painesville, O.....	Display 20 varieties.....	5 00
B. E. Poste, Columbus, O.....	2d ".....	3 00
Jas. Dunipace, Perrysburgh, O.....	Peck Seckel—Basket.....	2 00
J. H. Britton, Painesville, O.....	2d ".....	1 00
same	Basket Bartlett.....	2 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	1 00

PLATE PEARS.

Owner's name and address.	Name of article.	Premium.
S. J. & S. R. Moore, Zanesville, O.....	Louise Bonne DeJersey.....	\$1 00
Clint Adams, Sabina, O.....	2d ".....	50
J. F. Bowman, Forgy, O.....	Onondago.....	1 00

PLATE PEARS—Continued.

Owner's name and address.	Name of article.	Premium.
D. O. Frantz, Springfield, O.....	2d best Onondago.....	\$ 50
Grant Dresbach, Hallsville, O.....	Best Seckel.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	50
Geo. Garrison, Greenland, O.....	Vicar of Winkfield.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	President.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	Keffer.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
Nelson Cox, Bradrick, O.....	Buffum.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
same.....	Winter Nelis.....	1 00
Isaac Freeman, Rex, O.....	Glout Morceau.....	1 00
same.....	Le Conte.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	Mt. Vernon.....	1 00
Jacob Linxweller, Dayton, O.....	Souvenir de Congress.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
J. H. Britton, Painesville, O.....	Bartlett.....	1 00
H. J. Tryon, Willoughby, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Belle Lucrative.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50
T. T. Finney, Paint Valley, O.....	Beurre Bosc.....	1 00
Nelson Cox, Bradrick, O.....	Beurre Clairgeau.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	Beurre d'Anjou.....	1 00
J. H. Britton, Painesville, O.....	2d ".....	50
T. T. Finney, Paint Valley, O.....	Beurre Dill.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
Chas. D. Tryon, Willoughby, O.....	Clapp's Favorite.....	1 00
Isaac Freeman, Rex, O.....	2d ".....	50
same.....	Columbia.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
J. H. Britton, Painesville, O.....	Doyenne Boussock.....	1 00
H. G. Tryon, Willoughby, O.....	2d ".....	50
Clint Adams, Sabina, O.....	Duchess d'Angouleme.....	1 00
Wm. Polen, Hallsville, O.....	2d ".....	50
R. E. Poste, Columbus, O.....	Flemish Beauty.....	1 00
J. H. Britton, Painesville, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Howell.....	1 00
Wm. Polen, Hallsville, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	Sheldon.....	1 00
J. H. Britton, Painesville, O.....	2d ".....	50
same.....	Lawrence.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50

PLUMS—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
Hurst & Hurst, Chillicothe, O.....	Best display 10 varieties.....	\$5 00
same.....	" 5 ".....	3 00
W. H. West, ".....	" 3 ".....	2 00
Hurst & Hurst, ".....	2d best display 3 varieties.....	1 00

PLATE PLUMS.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best Lombard.....	\$1 00
Jas. Dunipace, Perrysburg, O.....	2d ".....	50
Hurst & Hurst, Chillicothe, O.....	Best Bradshaw.....	1 00
same.....	" Imperial Gage.....	1 00
same.....	" Pond's seedling.....	1 00
Wm. D. Mills.....	" Coe's Golden Drop.....	1 00
W. W. Farnsworth, Waterville, O.....	" Wild Goose.....	1 00
Daniel Duer, Millersburgh, O.....	2d best Wild Goose.....	50
Hurst & Hurst, Chillicothe, O.....	Best Long Scarlet.....	1 00
W. H. West, Chillicothe, O.....	" Shropshire Damson.....	1 00
Jas. Dunipace, Perrysburg, O.....	2d best ".....	50
Hurst & Hurst, Chillicothe, O.....	Best Green Gage.....	1 00
same.....	" Smith's Orleans.....	1 00
same.....	" Washington.....	1 00
same.....	" Jefferson.....	1 00
same.....	" Magnum Bonum.....	1 00
W. W. Farnsworth, Waterville, O.....	" any other variety.....	1 00

QUINCES.

Owner's name and address.	Name of article.	Premium.
W. H. Ortman, Hallsville, O.....	Best Orange.....	\$1 00
H. Bookwalter, ".....	2d ".....	50
J. G. Bilderback, Millersburgh, O.....	Best Champion.....	1 00
H. Bookwalter, Hallsville, O.....	" Res's Mammoth.....	1 00
W. H. Ortman, ".....	2d ".....	50
H. Bookwalter, ".....	Best peck quinces.....	2 00
L. Bookwalter, ".....	2d ".....	1 00

PEACHES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
S. H. Hurst, Chillicothe, O.....	Best display 12 varieties.....	\$4 00
W. H. West, ".....	2d ".....	3 00
S. H. Hurst, ".....	Best basket $\frac{1}{2}$ bushel.....	2 00
Hurst & Hurst, ".....	" plate 1 variety.....	1 50
Mrs. Joshua Seney, Chillicothe, O.....	2d ".....	1 00
Hurst & Hurst, ".....	Best 3 varieties.....	2 00
W. H. West, ".....	2d ".....	1 00
same.....	Best 6 varieties.....	3 00
S. H. Hurst, ".....	2d ".....	2 00
W. H. Innis, Columbus, O.....	Best new seedling.....	1 00
Isaac Freeman, Rex, O.....	2d ".....	50

PLATE PEACHES.

Owner's name and address.	Name of article.	Premium.
S. H. Hurst, Chillicothe, O.....	Best Chinese Cling.....	\$1 00
Hurst & Hurst, Chillicothe, O.....	" La Grange.....	1 00
W. H. West, ".....	" Heath Cling.....	1 00
same ".....	" Free.....	1 00
Hurst & Hurst, ".....	2d best Heath Free.....	50
same ".....	Best Pride of Essex.....	1 00
W. H. West, ".....	" Grosse Mignone.....	1 00
same ".....	" Lemon Cling.....	1 00
David Strous, Adelphi, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Morris White.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
same ".....	Best Red Cheek Melocaton.....	1 00
S. H. Hurst, Chillicothe, O.....	" Druid Hill.....	1 00
Chas. D. Tryon, Willoughby, O.....	" Crawford's Early.....	1 00
S. H. Hurst, Chillicothe, O.....	2d best ".....	50
F. H. Johnson, Musselman, O.....	Best Crawford's Late.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
J. B. Reason, Laurelville, O.....	Best Old Nixon Free.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
same ".....	Best Old Nixon Cling.....	1 00
Hurst & Hurst, Chillicothe, O.....	" Stump the World.....	1 00
S. H. Hurst, ".....	2d best ".....	50
same ".....	Best Smock Free.....	1 00
W. H. West, ".....	2d ".....	50
Hurst & Hurst, ".....	Best President.....	1 00
Chas. D. Tryon, Willoughby, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Ward's Late.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
S. H. Hurst, ".....	Best Gudgeon's Late.....	1 00
Hurst & Hurst, Chillicothe, O.....	" Honest John.....	1 00
Chas. D. Tryon, Willoughby, O.....	" Barsard's E. Rareripec.....	1 00

GRAPES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
W. H. West, Chillicothe, O.....	Best display 20 varieties.....	\$3 00
Jacob Linxweiler, Dayton, O.....	2d ".....	5 00
W. H. West, Chillicothe, O.....	Best display 10 varieties.....	5 00
same ".....	" 6 ".....	3 00
John S. Snider, Lancaster, O.....	2d best " 6 ".....	2 00
W. H. West, Chillicothe, O.....	Best display 3 ".....	2 00
John S. Snider, Lancaster, O.....	2d best 3 ".....	1 50
same ".....	Best new seedling.....	1 50
W. H. West, Chillicothe, O.....	" 3 plates table grapes.....	2 00
John S. Snider, Lancaster, O.....	2d ".....	2 00
W. H. West, Chillicothe, O.....	Best 3 plates of late.....	3 00
John S. Snider, Lancaster, O.....	2d ".....	2 00

PLATE GRAPES.

Owner's name and address.	Name of article.	Premium.
W. H. West, Chillicothe, O.....	Catawba.....	\$1 00
John S. Snyder, Lancaster, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Concord.....	1 00
John S. Snyder, Lancaster, O.....	2d ".....	50

PLATE GRAPES—Continued.

Owner's name and address.	Name of article.	Premium.
Isaac Freeman, Rex, O.....	Delaware.....	\$1 00
W. H. West, Chillicothe, O.....	2d ".....	50
John S. Snyder, Lancaster, O.....	Ives.....	1 00
W. H. West, Chillicothe, O.....	2d best Ives.....	50
same.....	Martha.....	1 00
Mrs. Joshua Seney, Chillicothe, O.....	Best Norton's Virginia.....	1 00
J. Linxweiler, Dayton, O.....	2d ".....	50
John S. Snyder, Lancaster, O.....	Best Wilder.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
same.....	Best Brighton.....	1 00
same.....	" Worden.....	1 00
J. Linxweiler, Dayton, O.....	" Woodruff Red.....	1 00
W. H. West, Chillicothe, O.....	" Moore's Early.....	1 00
J. Linxweiler, Dayton, O.....	" Jefferson.....	1 00
John S. Snyder, Lancaster, O.....	2d ".....	50
Mrs. Krotchwalt, Dayton, O.....	Best Pocklington.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
same.....	Best Lady Washington.....	1 00
Mrs. Krotchwalt, Dayton, O.....	2d ".....	50
John S. Snyder, Lancaster, O.....	Best Missouri Riesling.....	1 00
J. Linxweiler, Dayton, O.....	2d ".....	50
John S. Snyder, Lancaster, O.....	Best Elvira.....	1 00
J. Linxweiler, Dayton, O.....	" Vergennes.....	1 00
W. H. West, Chillicothe, O.....	" Empire State.....	1 00
E. Wellman, Willoughby, O.....	" Niagara.....	1 00
J. Linxweiler, Dayton, O.....	2d ".....	50
John S. Snyder, Lancaster, O.....	Best Diana.....	1 00
W. H. West, Chillicothe, O.....	" Iona.....	1 00
F. H. Johnson, Musselman, O.....	" Walter.....	1 00
W. H. West, Chillicothe, O.....	" Agawam.....	1 00

FRUITS IN VARIETY.

Owner's name and address.	Name of article.	Premium.
D. O. Frantz, Clarke county, O.....	Best 200 plates by County Horticultural Society.....	\$100 00
Lake county, Painesville, O.....	2d ".....	83 33
Franklin county, Zanesville, O.....	3d ".....	66 66
Franklin county, Chillicothe, O.....	4th ".....	50 00

SECOND EXAMINATION.

SUMMER AND FALL APPLES.

Owner's name and address.	Name of article.	Premium.
A. Hallman, Hallsville, O.....	Best approved new variety.....	\$2 00
W. H. West, Chillicothe, O.....	Three varieties, size and beauty.....	2 00
G. C. Housekeeper, Bowling Green, O.....	2d ".....	1 00
W. H. West, Chillicothe, O.....	Three varieties, market.....	2 00
J. J. McMillen, Van Wert, O.....	2d ".....	1 00
J. G. Bilderback, Millersburgh, O.....	Variety of summer dessert.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50

SUMMER AND FALL APPLES—Continued.

Owner's name and address.	Name of article.	Premium.
J. P. Streeper, Chillicothe, O.....	Variety of fall dessert	\$1.00
Isaac Freeman, Rex, O.....	2d "	50
J. J. McMillen, Van Wert, O.....	1/4 bushel basket 6 varieties.....	3.00
W. H. West, Chillicothe, O.....	2d "	2.00
J. J. McMillen, Van Wert, O.....	Best display 10 varieties	3.00
W. H. West, Chillicothe, O.....	2d "	2.00
J. J. McMillen, Van Wert, O.....	Best display 15 varieties.....	5.00
Jas. Dunipace, Perrysburgh, O.....	2d "	8.00
J. G. Bilderback, Millersburgh, O.....	Best display 20 varieties	6.00
Jas. Dunipace, Perrysburgh, O.....	2d "	4.00

PLATE APPLES—SUMMER AND FALL.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best Duchess of Oldenburg	\$1.00
J. G. Bilderback, Millersburgh, O.....	2d "	50
Grant Dresbach, Hallsville, O.....	Best Fall Pippin.....	1.00
J. G. Bilderback, Millersburgh, O.....	2d "	50
J. P. Streeper, Chillicothe, O.....	Best Fall Winc.....	1.00
G. C. Housekeeper, Bowling Green, O.....	2d "	50
J. P. Streeper, Chillicothe, O.....	Best Gravenstein.....	1.00
W. H. West, Chillicothe, O.....	2d "	50
J. R. Abernathy, Chillicothe, O.....	Best Ohio Nonpareil	1.00
Hurst and Hurst, "	2d "	50
Geo. Hoover, Hallsville, O.....	Best Western Beauty.....	1.00
Geo. Porter, Slate Mills, O.....	2d "	50
W. H. West, Chillicothe, O.....	Best Benoni.....	1.00
S. J. & S. R. Moore, Zanesville, O.....	2d "	50
J. G. Bilderback, Millersburgh, O.....	Best Maiden's Blush.....	1.00
H. Buchwalter, Hallsville, O.....	2d "	50
Hurst & Hurst, Chillicothe, O.....	Best Early Harvest.....	1.00
G. C. Housekeeper, Bowling Green, O.....	2d "	50
J. S. Marcellus, Zanesville, O.....	Best Red Astrachan.....	1.00
G. C. Housekeeper, Bowling Green, O.....	2d "	50
J. G. Bilderback, Millersburgh, O.....	Best Chenango Strawberry.....	1.00
A. Hallman, Hallsville, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Best Lowell.....	1.00
D. O. Franz, Springfield, O.....	2d "	50
A. Senff, Kingston, O.....	Best Summer Queen.....	1.00
J. S. Marcellus, Zanesville, O.....	2d "	50
G. C. Housekeeper, Bowling Green, O.....	Best Buckingham.....	1.00
S. J. & S. R. Moore, Zanesville, O.....	Best Porter.....	1.00
Alex. Hodgson, Chillicothe, O.....	2d "	50
E. G. Stockman, Prospect, O.....	Best Alexander.....	1.00
H. C. Darnell, Grove City, O.....	2d "	50
H. Buchwalter, Hallsville, O.....	Best Cooper's Market.....	1.00
J. G. Bilderback, Millersburgh, O.....	2d "	50
Wm. Ashworth, Kingston, O.....	Best Calvert.....	1.00
Amos D. Leib, Millersport, O.....	2d "	50
J. F. Bowman, Forgy, O.....	Best Flora.....	1.00
Hurst & Hurst, Chillicothe, O.....	2d "	50
Wm. Ashworth, Kingston, O.....	Best Golden Pippin.....	1.00
Geo. Foster, Chillicothe, O.....	2d "	50
J. G. Bilderback, Millersburgh, O.....	Best Yellow Transparent.....	1.00
G. C. Housekeeper, Bowling Green, O.....	2d "	50

PLATE APPLES—WINTER.

Owner's name and address.	Name of article.	Premium.
J. F. Bowman, Forgry, O.....	Best Baldwin	\$1 00
A. Rapstalk, Hallsville, O.....	2d ".....	50
J. B. Reason, Laurelville, O.....	Best Y. Belleflower.....	1 00
J. P. Streep, Chillicothe, O.....	2d ".....	50
Jas. Dunipace, Perrysburgh, O.....	Best Belmont.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50
J. B. Reason, Laurelville, O.....	Best Ben Davis.....	1 00
W. H. Ortman, Hallsville, O.....	2d ".....	50
Hurst & Hurst, Chillicothe, O.....	Best Ortley.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	50
Hurst & Hurst, Chillicothe, O.....	Best Haas.....	1 00
J. F. Bowman, Forgry, O.....	2d ".....	50
W. H. Ortman, Hallsville, O.....	Best Fallwater.....	1 00
Mr. Drumm.....	2d ".....	50
S. Long, Hallsville, O.....	Best Grime's Golden.....	1 00
Alex. Hodgson, Chillicothe, O.....	2d ".....	50
D. O. Frantz, Springfield, O.....	Hubbartson's Nonesuch.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
J. B. Reason, Laurelville, O.....	Best Jonathan.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
Henry Long, Adelphi, O.....	Best King of T. County.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
J. W. B. Youtsey, Troy, O.....	Best Northern Spy.....	1 00
Geo. Hoover, Hallsville, O.....	2d ".....	50
A. Hallman, Hallsville, O.....	Best Peck's Pleasant.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	Best Red Canada.....	1 00
W. H. Innis, Columbus, O.....	2d ".....	50
H. Bookwalter, Hallsville, O.....	Best Rambo.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	50
Morgan County.....	Best Rhode Island Greening.....	1 00
F. P. Dill, Westerville, O.....	2d ".....	50
Nelson Cox, Bradrick, O.....	Best Rome Beauty.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	50
Nelson Cox, Bradrick, O.....	Best Roxbury Russet.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
J. B. Reason, Laurelville, O.....	Best Smith's Cider.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
same.....	Best Twenty Ounce.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
J. B. Reason, Laurelville, O.....	Best White Pippin.....	1 00
S. H. Hurst, Chillicothe, O.....	2d ".....	50
F. P. Dill, Westerville, O.....	Best Stark.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
J. F. Bowman, Forgry, O.....	Best Wagener.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
L. Buchwalter, Hallsville, O.....	Best N. Spitzenberg.....	1 00
S. H. Hurst, Chillicothe, O.....	2d ".....	50
J. P. Streep, Chillicothe, O.....	Best American Golden Russet.....	1 00
Hurst & Hurst.....	2d ".....	50
Mrs. Jones, Hallsville, O.....	Best Limber Twig.....	1 00
S. H. Hurst, Chillicothe, O.....	2d ".....	50
P. Hinton, Hallsville, O.....	Best Willow Twig.....	1 00
J. S. Marcellus, Zanesville, O.....	2d ".....	50
P. Hinton, Hallsville, O.....	Best Par. Winter Sweet.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	Best Smokehouse.....	1 00
A. Hallman, Hallsville, O.....	2d ".....	50
E. G. Stockman, Prospect, O.....	Best Wealthy.....	1 00
B. Strawser, Adelphi, O.....	Best Fluk.....	1 00
L. Buchwalter, Hallsville, O.....	2d ".....	50
Mrs. Bitzer.....	Best Wine Sap.....	1 00
J. F. Bowman, Forgry, O.....	2d ".....	50
S. J. & S. R. Moore, Zanesville, O.....	Best Roman Stem.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
Nelson Cox, Bradrick, O.....	Best Romanite.....	1 00
Andrew Senff, Kingston, O.....	2d ".....	50
F. P. Dill, Westerville, O.....	Best Newton Pippin.....	1 00
Grant Dresbach, Hallsville, O.....	2d ".....	50
Daniel Duer, Millersburgh, O.....	Best Bl. Gilliflower.....	1 00
D. O. Frantz, Springfield, O.....	2d ".....	50
Mrs. Joshua Seney, Chillicothe, O.....	Best Penn. Redstreak.....	1 00
J. B. Reason, Laurelville, O.....	2d ".....	50
same.....	Best Lady Apple.....	1 00
H. Bookwalter, Hallsville, O.....	2d ".....	50
J. B. Reason, Laurelville, O.....	Best Milan.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50

PLATE APPLES—WINTER—Continued.

Owner's name and address.	Name of article.	Premium.
Hurst & Hurst, Chillicothe, O.....	Best Fameuse and Snow.....	\$1 00
J. P. Streeper, Chillicothe, O.....	2d ".....	50
Daniel Duer, Millersburgh, O.....	Best English Russet.....	1 00
Mrs. Rudle, Hallsville, O.....	2d ".....	50
F. B. Dill, Westerville, O.....	Best Esopus Spitzenberg.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
Nelson Cox, Bradrick, O.....	Best Rawle's Janet.....	1 00
J. B. Reason, Laurelville, O.....	2d ".....	50
Grant Dresbach, Hallsville, O.....	Best Prior's Red.....	1 00
Nelson Cox, Bradrick, O.....	2d ".....	50
G. C. Housekeeper, Bowling Green, O.....	Best Broadwell.....	1 00
Wm. Ashworth, Kingston, O.....	Best Bailey's Sweet.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
J. F. Bowman, Forgry, O.....	Best Pewawkee.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best St. Lawrence.....	1 00
J. P. Streeper, ".....	2d ".....	50
F. P. Dill, Westerville, O.....	Best Talman Sweet.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
W. H. West, ".....	Best Penn. Vanderveer.....	1 00
Milton Jones, ".....	2d ".....	50
Wm. Ashworth, Kingston, O.....	Westfield Seek-no-Further.....	1 00
F. P. Dill, Westerville, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Best York Imperial.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	2d best Holland Pippin.....	50

WINTER APPLES—IN VARIETIES.

Owner's name and address.	Name of article.	Premium.
Daniel Duer, Millersburgh, O.....	Best new variety.....	\$2 00
Wm. Ashworth, Kingston, O.....	Five varieties, quality and profit.....	2 00
J. F. Bowman, Forgry, O.....	2d ".....	1 00
J. B. Reason, Laurelville, O.....	Ten varieties, quality and profit.....	3 00
Daniel Duer, Millersburgh, O.....	2d ".....	2 00
J. F. Bowman, Forgry, O.....	Fifteen varieties.....	5 00
J. B. Reason, Laurelville, O.....	2d ".....	3 00
G. C. Housekeeper, Bowling Green, O.....	Five varieties, size and beauty.....	2 00
Daniel Duer, Millersburgh, O.....	2d ".....	1 00
S. J. & S. R. Moore, Zanesville, O.....	Best variety dessert.....	1 00
W. R. Bitzer, Hallsville, O.....	2d ".....	50
Grant Dresbach, ".....	Three varieties dessert.....	2 00
Daniel Duer, Millersburgh, O.....	2d ".....	1 00
J. B. Reason, Laurelville, O.....	Six varieties, profit to rule.....	2 00
F. P. Dill, Westerville, O.....	2d ".....	1 00
S. J. & S. R. Moore, Zanesville, O.....	Half bushel basket 10 varieties.....	3 00
F. P. Dill, Westerville, O.....	2d ".....	2 00
J. J. McMillen, Van Wert, O.....	Best 20 varieties.....	5 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	3 00
Daniel Duer, Millersburgh, O.....	Best display 30 varieties.....	6 00
J. J. McMillen, Van Wert, O.....	2d ".....	4 00

AWARDS.

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CRAB APPLES.

Owner's name and address.	Name of article.	Premium.
S. J. & S. R. Moore, Zanesville, O.....	Best Transcendent.....	\$1 00
W. H. Covault, Casstown, O.....	2d ".....	50
J. F. Bowman, Forgry, O.....	Best Hyslop.....	1 00
Mrs. Bitzer, Hallsville, O.....	2d ".....	50
H. Bookwalter, Hallsville, O.....	2d best Quaker Beauty.....	50
Isaac Freeman, Rex, O.....	Best Whitney's No. 20.....	1 00
J. W. B. Youtsey, Troy, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Best collection of crabs.....	2 00
J. W. B. Youtsey, Troy, O.....	2d ".....	1 00

PEARS—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
J. H. Britton, Painesville, O.....	Six varieties summer and fall.....	\$2 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	1 00
J. H. Britton, Painesville, O.....	Twelve varieties summer and fall.....	3 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	2 00
J. H. Britton, Painesville, O.....	Three plates large, size and beauty.....	1 50
Jas. Dunipace, Perrysburgh, O.....	2d ".....	1 00
J. P. Streeper, Chillicothe, O.....	Three varieties market, profit.....	1 50
J. H. Britton, Painesville, O.....	2d ".....	1 00
J. P. Streeper, Chillicothe, O.....	Three varieties dessert.....	1 50
J. H. Britton, Painesville, O.....	2d ".....	1 00
same	Display 20 varieties.....	5 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	3 00
J. P. Streeper, Chillicothe, O.....	Peck Seckel.....	2 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	1 00
J. H. Britton, Painesville, O.....	Basket Bartlett.....	2 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	1 00

PLATE PEARS.

Owner's name and address.	Name of article.	Premium.
S. J. & S. R. Moore, Zanesville, O.....	Louise Bonne DeJersey.....	\$1 00
J. P. Streeper, Chillicothe, O.....	2d ".....	50
J. W. B. Youtsey, Troy, O.....	Onondago.....	1 00
J. F. Bowman, Forgry, O.....	2d ".....	50
Grant Dresbach, Hallsville, O.....	Seckel.....	1 00
Mrs. Josh. Seney, Chillicothe, O.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Vicar of Winkfield.....	1 00
Isaac Freeman, Rex, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	President.....	1 00
J. G. Bilderback, Millersburgh, O.....	Keffer.....	1 00
J. P. Streeper, Chillicothe, O.....	2d ".....	50
same	Buffum.....	1 00
Nelson Cox, Bradrick, O.....	2d ".....	50
J. P. Streeper, Chillicothe, O.....	Winter Nellis.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
J. P. Streeper, Chillicothe, O.....	Buerre Easter.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Glout Morceau.....	1 00
same	Le Comte.....	1 00
D. O. Frantz, Springfield, O.....	2d ".....	50
J. W. B. Youtsey, Troy, O.....	Mt. Vernon.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50
J. G. Bilderback, Millersburgh, O.....	2d Souvenir de Congress.....	50

PLATE PEARS—Continued.

Owner's name and address.	Name of article.	Premium.
J.H. Britton, Painesville, O.....	Bartlett	\$1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
J. H. Britton, Painesville, O.....	Belle Lucrative.....	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
T. T. Finney.....	Beurre Rose.....	1 00
J. P. Streeper, Chillicothe, O.....	Beurre Clairgeau.....	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
same	Beurre d'Anjou	1 00
J. H. Britton, Painesville, O.....	2d "	50
J. P. Streeper, Chillicothe, O.....	Beurre Diel.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Clapp's Favorite.....	1 00
Ira Mosher & Son, Chillicothe, O.....	Columbia	1 00
J. W. B. Youtsey, Troy, O.....	2d "	50
J. H. Britton, Painesville, O.....	Doyenne Boussock	1 00
Isaac Freeman, Rex, O.....	Duchess d'Angouleme	1 00
D. O. Frantz, Springfield, O.....	2d "	50
G. Newton, Willoughby, O.....	Flemish Beauty	1 00
J. H. Britton, Painesville, O.....	2d "	50
H. Keenan, Quaker City, O.....	Howell	1 00
J. W. B. Youtsey, Troy, O.....	2d "	50
J. P. Streeper, Chillicothe, O.....	Sheldon	1 00
J. Alban, Hallsville, O.....	2d "	50
J. H. Britton, Painesville, O.....	Lawrence	1 00
Isaac Freeman, Rex, O.....	2d "	50

PLUMS—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best display five varieties.....	\$3 00
same	Best display three varieties	2 00
W. H. West, Chillicothe, O.....	2d "	1 00

PLATE PLUMS.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best Lombard.....	\$1 00
same	" Bradshaw	1 00
E. V. Rhoads, St. Paris, O.....	" Coe's Golden Drop	1 00
W. W. Farnsworth, Waterville, O.....	" Wild Goose.....	1 00
W. H. West, Chillicothe, O.....	Best Shropshire Damson.....	1 00
Amos D. Leib, Millersport, O.....	2d "	50
E. V. Rhoads, St. Paris, O.....	Best Miner	1 00
E. V. Rhoads, St. Paris, O.....	" Weaver	1 00
W. W. Farnsworth, Waterville, O.....	Best any other variety.....	1 00
same	2d "	50
E. V. Rhoads, St. Paris, O.....		

QUINCES.

Owner's name and address.	Name of article.	Premium.
F. G. Withoft, Dayton, O.....	Best Orange.....	\$1 00
J. P. Streeper, Chillicothe, O.....	2d ".....	50
J. G. Bilderback, Millersburgh, O.....	Best Champion.....	1 00
E. V. Rhoads, St. Paris, O.....	2d ".....	50
H. Bookwalter, Hallsville, O.....	Best Rea's Mammoth.....	1 00
W. H. Ortman, ".....	2d ".....	50
H. Bookwalter, Hallsville, O.....	Best peck quinces.....	1 00
J. P. Streeper, Chillicothe, O.....	2d ".....	50
W. H. Ortman, Hallsville, O.....	2d best display of quinces in variety.....	2 00

PEACHES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
S. H. Hurst, Chillicothe, O.....	Best display, twelve varieties.....	\$4 00
W. H. West, ".....	2d ".....	3 00
—same ".....	Best basket, one-half bushel.....	2 00
S. H. Hurst, ".....	2d ".....	1 00
Alex. Schultz, Bourneville, O.....	Best plate variety.....	1 50
W. H. West, Chillicothe, O.....	2d ".....	1 00
S. H. Hurst, ".....	Best three varieties.....	2 00
W. H. West, ".....	2d ".....	1 00
S. H. Hurst, ".....	Best six varieties.....	3 00
W. H. West, ".....	2d ".....	2 00
F. G. Mithoff, Dayton, O.....	Best new seedling.....	1 00
F. H. Johnson, Musselman, O.....	2d ".....	50

PLATE PEACHES.

Owner's name and address.	Name of article.	Premium.
F. H. Johnson, Musselman, O.....	Best Heath Cling.....	\$1 00
J. B. Reason, Laurelville, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Heath Free.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
G. C. Housekeeper, Bowling Green, O.....	Best George the Fourth.....	1 00
Amos D. Leib, Millersport, O.....	Best Lemon Cling.....	1 00
David Strausser, Adelphi, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Momi White.....	1 00
F. H. Johnson, Musselman, O.....	Best Salway.....	1 00
Amos D. Leib, Millersport, O.....	2d ".....	50
G. C. Housekeeper, Bowling Green, O.....	Best Crawford's Early.....	1 00
C. Hoose, Willoughby, O.....	Best Crawford's Late.....	1 00
Amos D. Leib, Millersport, O.....	2d ".....	50
E. V. Rhoads, St. Paris, O.....	Best Old Nixon Free.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
F. H. Johnson, Musselman, O.....	Best Old Nixon Cling.....	1 00
J. B. Reason, Laurelville, O.....	2d ".....	50
F. H. Johnson, Musselman, O.....	Best Steadly.....	1 00
J. P. T. Miller, Sharonville, O.....	Best Stump the World.....	1 00
S. H. Hurst, Chillicothe, O.....	2d ".....	50
Alex. Schultz, Bourneville, O.....	Best Smock Free.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
S. H. Hurst, ".....	Best Gudgeon's Late.....	1 00
F. H. Johnson, Musselman, O.....	Best Beer's Smock.....	1 00
Amos D. Leib, Millersport, O.....	2d ".....	50
C. Hoose, Willoughby, O.....	Best Marshall's Late.....	1 00

GRAPES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
E. M. Woodard, Kirtland, O.....	Best display 20 varieties.....	\$8 00
W. H. West, Chillicothe, O.....	2d ".....	5 00
E. M. Woodard, Kirtland, O.....	Best display 10 ".....	5 00
Isaac Freeman, Rex, O.....	2d ".....	5 00
E. M. Woodard, Kirtland, O.....	Best " 6 ".....	3 00
W. H. West, Chillicothe, O.....	2d ".....	3 00
same	Best " 3 ".....	2 00
E. M. Woodard, Kirtland, O.....	2d ".....	1 50
G. W. Campbell, Delaware, O.....	Best new seedling.....	1 50
Isaac Freeman, Rex, O.....	" 3 plates table grapes.....	3 00
E. M. Woodard, Kirtland, O.....	2d best 3 ".....	2 00
W. H. West, Chillicothe, O.....	Best 3 plates late.....	3 00
E. M. Woodard, Kirtland, O.....	2d ".....	2 00

PLATE GRAPES.

Owner's name and address.	Name of article.	Premium.
W. H. West, Chillicothe, O.....	Catawba.....	\$1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Concord.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
H. J. Tryon, Willoughby, O.....	Best Delaware.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
same	Best Ives.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Best Lady.....	1 00
same	" Martha.....	1 00
Mrs. Joseph Seney, Chillicothe, O.....	" Norton's Virginia.....	1 00
Jas. Dunipace, Perrysburgh, O.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Best Salem.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Best Brighton.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
same	Best Worden.....	1 00
C. House, Willoughby, O.....	2d ".....	50
Geo. W. Campbell, Delaware, O.....	Best Woodruff Red.....	1 00
E. M. Woodard, Kirtland, O.....	" Moore's Early.....	1 00
same	" Prentiss.....	1 00
H. J. Tryon, Willoughby, O.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Best Jefferson.....	1 00
Geo. W. Campbell, Delaware, O.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Best Pocklington.....	1 00
E. V. Rhoads, St. Paris, O.....	2d ".....	50
same	Best Lady Washington.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Best Early Victor.....	1 00
same	" Vergennes.....	1 00
E. V. Rhoads, St. Paris, O.....	2d ".....	50
Geo. W. Campbell, Delaware, O.....	Best Empire State.....	1 00
E. V. Rhoads, St. Paris, O.....	" Niagara.....	1 00
E. M. Woodard, Kirtland, O.....	" Lindley.....	1 00
Geo. W. Campbell, Delaware, O.....	" Massasoit.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
H. J. Tryon, Willoughby, O.....	Best Duchess.....	1 00
E. M. Woodard, Kirtland, O.....	" Diana.....	1 00
W. H. West, Chillicothe, O.....	" Iona.....	1 00
F. H. Johnson, Musselman, O.....	" Walter.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
same	Best Agawam.....	1 00

FRUITS IN VARIETY—COUNTY SHOW.

Owner's name and address.	Name of article.	Premium.
Montgomery county, Dayton, O.....	Best 200 plates by County Horticultural Society	\$100.00
Muskingum county, Zanesville, O.....	" " "	83.33
Lake county, Painesville, O.....	" " "	66.66
Ottawa county, Port Clinton, O.....	" " "	50.00

THIRD EXAMINATION.

SUMMER AND FALL APPLES.

Owner's name and address.	Name of article.	Premium.
Abraham Halman, Hallsville, O.....	Best approved new variety.....	\$2 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	1 00
same	Three varieties, size and beauty.....	2 00
J. G. Housekeeper, Bowling Green, O.....	2d ".....	1 00
S. J. & S. R. Moore, Zanesville, O.....	Three varieties, market.....	2 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	1 00
same	Variety of summer dessert.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	50
J. P. Streeper, Chillicothe, O.....	Variety of fall dessert.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	50
S. J. & S. R. Moore, Zanesville, O.....	1/4 bushel basket, six varieties.....	3 00
J. J. McMillen, Van Wert, O.....	2d ".....	2 00
J. G. Bilderback, Millersburgh, O.....	Best display 10 varieties.....	3 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	2 00
A. W. Farnsworth, Waterville, O.....	Best display 15 varieties.....	5 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	3 00
same	Best display 20 varieties.....	6 00
J. G. Bilderback, Millersburgh, O.....	2d ".....	4 00

PLATE APPLES—SUMMER AND FALL.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best Duchess of Oldenburg.....	\$1.00
J. G. Bilderback, Millersburgh, O.....	2d ".....	.50
Grant Dresback, Hallsville, O.....	Best Fall Pippin.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
J. P. Streeper, ".....	Best Fall Wine.....	1 00
Hurst & Hurst, ".....	2d ".....	.50
W. H. West, ".....	Best Gravenstein.....	1 00
J. P. Streeper, ".....	2d ".....	.50
Jno. R. Abernathy, ".....	Best Ohio Nonpareil.....	1.00
W. F. Barr, Brice, O.....	2d ".....	.50
Geo. Hoover, Hallsville, O.....	Best Western Beauty.....	1.00
S. H. Hurst, Chillicothe, O.....	2d ".....	.50
S. J. & S. R. Moore, Zanesville, O.....	Best Benoni.....	1.00
W. H. West, Chillicothe, O.....	2d ".....	.50
H. Bookwalter, Hallsville, O.....	Best Maiden's Blush.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50
J. G. Bilderback, Millersburgh, O.....	Best Early Harvest.....	1 00
G. C. Housekeeper, Bowling Green, O.....	2d ".....	50
J. G. Bilderback, Millersburgh, O.....	Best Red Astrachan.....	1 00
Daniel Duer, ".....	2d ".....	50
J. G. Bilderback, ".....	Best Chenango Strawberry.....	1 00

PLATE APPLES—SUMMER AND FALL—Continued.

Owner's name and address.	Name of article.	Premium.
W. Farnsworth, Waterville, O.....	2d best Chenango Strawberry.....	\$ 50
same	Best Lowell.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d "	50
same	Best Summer Queen.....	1 00
G. C. Housekeeper, Bowling Green, O.....	2 "	50
same	Best Buckingham.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	" Porter.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d best Porter.....	50
H. C. Darnell, Grove City, O.....	Best Alexander.....	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
H. Bookwalter, Hallsville, O.....	Best Cooper's Market.....	1 00
F. Bookwalter, ".....	2d "	50
Amos D. Leib, Millersport, O.....	best Calvert.....	1 00
Wm. Ashworth, Kingston, O.....	2d "	50
S. H. Hurst, Chillicothe, O.....	Best Beauty of Kent.....	1 00
W. F. Barr, Brice, O.....	" Flora.....	1 00
Mrs. Bitzer, Hallsville, O.....	2d best Flora.....	50
Wm. Ashworth, Kingston, O.....	Best Golden Pippin.....	1 00
F. P. Dill, Westerville, O.....	2d "	50
Daniel Duer, Millersburgh, O.....	Best Yellow Transparent.....	1 00
J. G. Bilderback, ".....	2d "	50

PLATE APPLES—WINTER.

Owner's name and address.	Name of article.	Premium.
S. H. Hurst, Chillicothe, O.....	Best Baldwin.....	\$1 00
F. P. Dill, Westerville, O.....	2d "	50
Grant Dresback, Hallsville, O.....	Best Y. Belleflower.....	1 00
H. Kellogg, Toledo, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Best Belmont.....	1 00
Daniel Duer, Millersburgh, O.....	2d "	50
H. Bookwalter, Hallsville, O.....	Best Ben Davis.....	1 00
Mrs. Riason, Laurelville, O.....	2d "	50
S. J. & S. R. Moore, Zanesville, O.....	Best Ortley.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d "	50
Isaac Freeman, Rex, O.....	Best Haas.....	1 00
J. F. Bowman, Forgry, C.....	2d "	50
W. H. Ortman, Hallsville, O.....	Best Fallwater.....	1 00
Mr. Drumm.....	2d "	50
Johnston Beattie, Zanesville, O.....	Best Grimes' Golden.....	1 00
Salena Long, Hallsville, O.....	2d "	50
Daniel Duer, Millersburgh, O.....	Hubbardson's Nonesuch.....	1 00
J. W. B. Youtzey, Troy, O.....	2d "	50
Hurst & Hurst, Chillicothe, O.....	Best Jonathan.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d "	50
Daniel Duer, Millersburgh, O.....	Best King of Tompkins County.....	1 00
H. Bookwalter, Hallsville, O.....	2d "	50
S. J. & S. R. Moore, Zanesville, O.....	Best Northern Spy.....	1 00
Wm. Ashworth, Kingston, O.....	2d "	50
Abraham Halman, Hallsville, O.....	Best Peck's Pleasant.....	1 00
Daniel Duer, Millersburgh, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Best Red Canada.....	1 00
Daniel Duer, Millersburgh, O.....	2d "	50
same	Best Rambo.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d "	50
Amos D. Leib, Millersport, O.....	Best Rhode Island Greening.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d "	50
Nelson Cox, Bradrick, O.....	Best Rome Beauty.....	1 00
Grant Dresback, Hallsville, O.....	2d "	50
E. R. Miller, Pleasant Corners, O.....	Best Boxbury Russet.....	1 00
J. P. Streep, Chillicothe, O.....	2d "	50
H. Bookwalter, Hallsville, O.....	Best Smith's Cider.....	1 00
W. H. West, Chillicothe, O.....	2d "	50
Daniel Duer, Millersburgh, O.....	Best Twenty Ounce.....	1 00
J. P. Streep, Chillicothe, O.....	2d "	50

PLATE APPLES—WINTER—Continued.

Owner's name and address.	Name of article.	Premium.
Wm. Ashworth, Kingston, O.....	Best White Pippin.....	\$1 00
Jos. Zipper, Chillicothe, O.....	2d ".....	50
F. P. Dill, Westerville, O.....	Best Stork.....	1 00
W. W. Farnsworth, Waterville, O.....	2d ".....	50
J. F. Bowman, Forgy, O.....	Best Wagener.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Best Newton Spitzenberg.....	1 00
W. H. Ortman, Hallsville, O.....	2d ".....	50
J. P. Streep, Chillicothe, O.....	Best American Golden Russet.....	1 00
Hurst & Hurst, ".....	2d ".....	50
Mrs. Jones, Hallsville, O.....	Best Limber Twig.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
same.....	Best Willow Twig.....	1 00
P. Hinton, Hallsville, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Paradise Winter Sweet.....	1 00
P. Hinton, Hallsville, O.....	2d ".....	50
W. W. Farnsworth, Waterville, O.....	Best Smokehouse.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
J. B. Reason, Laurelvill, O.....	Best Wealthy.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
F. P. Dill, Westerville, O.....	Best Fink.....	1 00
Hurst & Hurst, Chillicothe, O.....	2d ".....	50
Wm. Ashworth, Kingston, O.....	Best Wine Sap.....	1 00
H. Bookwalter, Hallsville, O.....	2d ".....	50
Hurst & Hurst, Chillicothe, O.....	Best Roman Stem.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
Andrew Seuff, Kingston, O.....	Best Romanite.....	1 00
Nelson Cox, Bradrick, O.....	2d ".....	50
Grant Dresback, Hallsville, O.....	Best Newton Pippin.....	1 00
S. J. & S. R. Moore, Zanesville, O.....	2d ".....	50
Isaac Freeman, Rex, O.....	Best Black Gilliflower.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
J. B. Reason, Laurelvill, O.....	Best Penn. Red Streak.....	1 00
Mrs. Joshua Seney, Chillicothe, O.....	2d ".....	50
H. Bookwalter, Hallsville, O.....	Best Lady Apple.....	1 00
Mrs. Reason, Laurelvill, O.....	2d ".....	50
J. P. Streep, Chillicothe, O.....	Best Milan.....	1 00
J. B. Reason, Laurelvill, O.....	2d ".....	50
S. J. & S. R. Moore, Zanesville, O.....	Best Fameuse or Snow.....	1 00
J. P. Streep, Chillicothe, O.....	2d ".....	50
Daniel Duer, Millersburgh, O.....	Best Detroit Red.....	1 00
D. O. Frantz, Springfield, O.....	2d ".....	50
Daniel Duer, Millersburgh, O.....	Best English Russet.....	1 00
Wm. Ashworth, Kingston, O.....	2d ".....	50
G. C. Housekeeper, Bowling Green, O.....	Best Esopus Spitzenberg.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
Wm. Wallace, Chillicothe, O.....	Best Rawle's Janet.....	1 00
Isaac Freeman, Rex, O.....	2d ".....	50
Wm. Ashworth, Kingston, O.....	Best Prior's Red.....	1 00
Nelson Cox, Bradrick, O.....	2d ".....	50
G. C. Housekeeper, Bowling Green, O.....	Best Kyle's Late Keeper.....	1 00
same.....	Best Broadwell.....	1 00
same.....	Best Mother Apple.....	1 00
J. F. Bowman, Forgy, O.....	Best Pewawkee.....	1 00
Daniel Duer, Millersburgh, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best St. Lawrence.....	1 00
J. P. Streep, ".....	2d ".....	50
Hurst & Hurst, ".....	Best Talman Sweet.....	1 00
G. Newton, Willoughby, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Penn. Vanderveer.....	1 00
E. E. Miller, Pleasant Corners, O.....	2d ".....	50
Wm. Ashworth, Kingston, O.....	Westfield Seek-no-Further.....	1 00
F. P. Dill, Westerville, O.....	2d ".....	50
J. Hickle, Hallsville, O.....	Best York Imperial.....	1 00
Isaac Freeman, Rex, O.....	2d ".....	50
J. F. Bowman, Forgy, O.....	Best Walbridge.....	1 00
J. W. B. Youtsey, Troy, O.....	Best Holland Pippin.....	1 00
J. P. Streep, Chillicothe, O.....	2d ".....	50
G. C. Housekeeper, Bowling Green, O.....	Best Wolf River.....	1 00

WINTER APPLES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
J. W. B. Youtsey, Troy, O.....	Best new variety	\$2 00
F. P. Gill, Westerville, O.....	Five varieties, quality and profit	2 00
W. H. West, Chillicothe, O.....	2d "	1 00
J. B. Reason, Laurelville, O.....	Ten varieties, quality and profit	3 00
J. J. McMillen, Van Wert, O.....	2d "	2 00
Daniel Duer, Millersburgh, O.....	Best 15 varieties	5 00
J. F. Bowman, Forgy, O.....	2d "	3 00
F. P. Gill, Westerville, O.....	Five varieties, size and beauty	2 00
J. W. B. Youtsey, Troy, O.....	2d "	1 00
S. J. & S. R. Moore, Zanesville, O.....	Variety dessert	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
Isaac Freeman, Rex, O.....	Three varieties dessert	2 00
Hurst & Hurst, Chillicothe, O.....	2d "	1 00
J. B. Reason, Laurelville, O.....	Six varieties, profit to rule	2 00
S. J. & S. R. Moore, Zanesville, O.....	2d "	1 00
same	One-half bushel basket, 10 varieties	3 00
Grant Dresbach, Hallsville, O.....	2d "	2 00
Hurst & Hurst, Chillicothe, O.....	Best 20 varieties	5 00
Grant Dresbach, Hallsville, O.....	2d "	3 00
Daniel Duer, Millersburgh, O.....	Best display 30 varieties	6 00
J. J. McMillen, Van Wert, O.....	2d "	4 00

CRAB APPLES.

Owner's name and address.	Name of article.	Premium.
S. J. & S. R. Moore, Zanesville, O.....	Best Transcendent	\$1 00
W. H. Covault, Casttown, O.....	2d "	50
Mrs. Bitzer, Hallsville, O.....	Best Hyalop	1 00
J. F. Bowman, Forgy, O.....	2d "	50
F. M. Benham, Olivet, Mich.....	Best Quaker Beauty	1 00
Isaac Freeman, Rex, O.....	Best Whitney's No. 20	1 00
J. W. B. Youtsey, Troy, O.....	2d "	50
Isaac Freeman, Rex, O.....	Best collection of crabs	2 00
J. W. B. Youtsey, Troy, O.....	2d "	1 00

PEARS—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
J. H. Britton, Painesville, O.....	Six varieties summer and fall	\$2 00
same	Twelve varieties summer and fall	3 00
W. W. Farnsworth, Waterville, O.....	2d "	2 00
J. H. Britton, Painesville, O.....	Three plates large, size and beauty	1 50
same	Three varieties, market profit	1 50
J. F. Streeper, Chillicothe, O.....	2d "	1 00
J. H. Britton, Painesville, O.....	Three varieties, dessert	1 50
J. F. Streeper, Chillicothe, O.....	2d "	1 00
J. H. Britton, Painesville, O.....	Display 20 varieties	5 00
W. W. Farnsworth, Waterville, O.....	2d "	3 00
Sarah Moore, Zanesville, O.....	Peck Seckel	2 00
Grant Dresbach, Hallsville, O.....	2d "	1 00

PLATE PEARS.

Owner's name and address.	Name of article.	Premium.
J. H. Britton, Painesville, O.....	Louise Bonne De Jersey	\$1 00
S. J. & S. R. Moore, Zanesville, O.....	2d "	50
J. W. B. Youtsey, Troy, O.....	Onondago	1 00
J. H. Britton, Painesville, O.....	2d "	50
H. G. Tryon, Willoughby, O.....	Seckel	1 00
Grant Dresbach, Hallsville, O.....	2d "	50
E. M. Woodard, Kirtland, O.....	Vicar of Winkfield.....	1 00
J. H. Britton, Painesville, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	President	1 00
J. P. Streeper, Chillicothe, O.....	Keffer	1 00
Daniel Duer, Millersburgh, O.....	2d "	50
J. P. Streeper, Chillicothe, O.....	Buffum	1 00
O. W. Aldrich, Columbus, O.....	2d "	50
J. P. Streeper, Chillicothe, O.....	Winter Nells.....	1 00
Isaac Freeman, Rex, O.....	2d "	50
J. W. B. Youtsey, Troy, O.....	Beurre Easter.....	1 00
J. P. Streeper, Chillicothe, O.....	2d "	50
J. W. B. Youtsey, Troy, O.....	Glout Morceau	1 00
J. P. Streeper, Chillicothe, O.....	2d "	50
Isaac Freeman, Rex, O.....	Le Comte.....	1 00
D. O. Frantz, Springfield, O.....	2d "	50
J. W. B. Youtsey, Troy, O.....	Mt. Vernon	1 00
Isaac Freeman, Rex, O.....	2d "	50
J. G. Bilderback, Millersburgh, O.....	Souvenir de Congress.....	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
same	Bartlett	1 00
same	Belle Lucrative.....	1 00
J. H. Britton, Painesville, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Beurre Rose.....	1 00
Thomas Merick, Dresden, O.....	" Clairgeau	1 00
J. G. Bilderback, Millersburgh, O.....	2d "	50
W. W. Farnsworth, Waterville, O.....	Beurre d'Anjou.....	1 00
J. G. Bilderback, Millersburgh, O.....	2d "	50
same	2d best Beurre Diel	50
W. W. Farnsworth, Waterville, O.....	Clapp's Favorite.....	1 00
J. W. B. Youtsey, Troy, O.....	Columbia	1 00
Ira Mosher & Son, Chillicothe, O.....	2d "	50
J. H. Britton, Painesville, O.....	Doyenne Boussock.....	1 00
H. G. Tryon, Willoughby, O.....	2d "	50
Isaac Freeman, Rex, O.....	Duchess d'Angouleme.....	1 00
J. H. Britton, Painesville, O.....	2d "	50
H. G. Tryon, Willoughby, O.....	Flemish Beauty	1 00
J. H. Britton, Painesville, O.....	2d "	50
same	Howell.....	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50
J. H. Britton, Painesville, O.....	Sheldon.....	1 00
H. G. Tryon, Willoughby, O.....	2d "	50
Vest & Story, Zanesville, O.....	Lawrence	1 00
W. W. Farnsworth, Waterville, O.....	2d "	50

PLUMS—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best display 10 varieties.....	\$5 00
same	" 5 "	3 00
same	" 3 "	2 00

PLATE PLUMS.

Owner's name and address.	Name of article.	Premium.
W. W. Farnsworth, Waterville, O.....	Best Lombard	\$1 00
W. H. West, Chillicothe, O.....	" Shropshire Damson.....	1 00
W. W. Farnsworth, Waterville, O.....	" Weaver.....	1 00
same	" any other variety	1 00

QUINCES.

Owner's name and address.	Name of article.	Premium.
J. P. Streeper, Chillicothe, O.....	Best Orange.....	\$1 00
W. H. Ortman, Hallsville, O.....	2d "	50
Daniel Duer, Millersburgh, O.....	Best Champion	1 00
J. G. Bilderback, "	2d "	50
H. Bookwalter, Hallsville, O.....	Best Rea's Mammoth.....	1 00
Johnston Bettie, Zanesville, O.....	2d "	50
J. P. Streeper, Chillicothe, O.....	Best peck quinces	2 00
H. Bookwalter, Hallsville, O.....	2d "	1 00
same	Best display of quinces in variety.....	3 00
W. H. Ortman, Hallsville, O.....	2d "	2 00

PEACHES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
Mrs. Reason, Laurelville, O.....	Best basket, $\frac{1}{2}$ bushel	\$2 00
H. J. Tryon, Willoughby, O.....	" plate 1 variety	1 50
S. H. Hurst, Chillicothe, O.....	2d "	1 00
same	Best 3 varieties.....	2 00
W. H. West, Chillicothe, O.....	2d "	1 00
same	Best 6 varieties.....	3 00
S. H. Hurst, Chillicothe, O.....	2d "	2 00
Amos D. Leib, Millersport, O.....	Best new seedling	1 00
H. J. Tryon, Willoughby, O.....	2d "	50

AWARDS.

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PLATE PEACHES.

Owner's name and address.	Name of article.	Premium.
W. H. West, Chillicothe, O.....	Best Heath Cling.....	\$1 00
John Nolan, Frazeysburg, O.....	2d ".....	50
Mrs. Reason, Laurelville, O.....	Best Salway.....	1 00
F. H. Johnson, Musseiman, O.....	2d ".....	50
H. J. Tryon, Willoughby, O.....	Best Crawford's Late.....	1 00
same.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Old Nixon Free.....	1 00
same.....	" Cling.....	50
H. J. Tryon, Willoughby, O.....	" Stump the World.....	1 00
same.....	Best Smock Free.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
S. H. Hurst, ".....	Best Gudgeon's Late.....	1 00
H. J. Tryon, Willoughby, O.....	" Marshall's Late.....	1 00

GRAPES—IN VARIETY.

Owner's name and address.	Name of article.	Premium.
E. M. Woodard, Kirtland, O.....	Best display twenty varieties.....	\$3.00
same.....	Best display ten varieties.....	5 00
W. H. West, Chillicothe, O.....	2d ".....	3 00
E. M. Woodard, Kirtland, O.....	Best display six varieties.....	3 00
W. H. West, Chillicothe, O.....	2d ".....	2 00
E. M. Woodard, Kirtland, O.....	Best three varieties.....	2 00
F. M. Benham, Olivet, Mich.....	2d ".....	1 50
E. M. Woodard, Kirtland, O.....	Best three plates table grapes.....	3 00
W. H. West, Chillicothe, O.....	2d ".....	2 00
E. M. Woodard, Kirtland, O.....	Best three plates Late.....	3 00
W. H. West, Chillicothe, O.....	2d ".....	2 00

PLATE GRAPES.

Owner's name and address.	Name of article.	Premium.
H. J. Tryon, Willoughby, O.....	Best Catawba.....	\$1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
H. J. Tryon, Willoughby, O.....	Best Concord.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
H. J. Tryon, Willoughby, O.....	Best Delaware.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
H. J. Tryon, Willoughby, O.....	Best Ives.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
same.....	Best Lady.....	1 00
same.....	Best Martha.....	1 00
H. J. Tryon, Willoughby, O.....	2d ".....	50
Mrs. Joshua Seney, Chillicothe, O.....	Best Norton Virginia.....	1 00
E. M. Woodard, Kirtland, O.....	Best Salem.....	1 00
H. J. Tryon, Willoughby, O.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Wilder.....	1 00
E. M. Woodard, Kirtland, O.....	Best Brighton.....	1 00
F. M. Benham, Olivet, Mich.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Best Worden.....	1 00
F. M. Benham, Olivet, Mich.....	2d ".....	50
Owen Turner, Zanesville, O.....	Best Moore's Early.....	1 00
F. M. Benham, Olivet, Mich.....	2d ".....	50
H. J. Tryon, Willoughby, O.....	Best Prentiss.....	1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50

PLATE GRAPES—Continued.

Owner's name and address.	Name of article.	Premium.
H. J. Tryon, Willoughby, O.....	Best Jefferson.....	\$1 00
E. M. Woodard, Kirtland, O.....	2d ".....	50
same	Best Pocklington.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50
same	Best Lady Washington.....	1 00
E. M. Woodard, Kirtland, Mich.....	Best Early Victor.....	1 00
F. M. Benham, Olivet, Mich.....	2d ".....	50
E. M. Woodard, Kirtland, O.....	Best Elvira.....	1 00
same	" Vergennes.....	1 00
F. M. Benham, Olivet, Mich.....	" Niagara.....	1 00
E. M. Woodard, Kirtland, O.....	" Lindley.....	1 00
same	" Massasoit.....	1 00
H. J. Tryon, Willoughby, O.....	" Duchess.....	1 00
E. M. Woodard, Kirtland, O.....	Best Diana.....	1 00
F. M. Benham, Olivet, Mich.....	2d ".....	50
W. H. West, Chillicothe, O.....	Best Iona.....	1 00
E. M. Woodard, Kirtland, O.....	Best Agawam.....	1 00
W. H. West, Chillicothe, O.....	2d ".....	50

FRUITS IN VARIETY—COUNTY SHOW.

County.	Name of article.	Premium.
Ottawa county, Port Clinton, O.....	Best 200 plates by County Horticultural Soc'y..	\$100 00
Montgomery county, Dayton, O.....	2d ".....	83 33
Wood county, Bowling Green, O.....	3d ".....	66 66
Clarke county, Springfield, O.....	4th ".....	50 00

PLANTS AND FLOWERS.

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PLANTS AND FLOWERS—Continued.

Owner's name and address.	Name of article.	Premium.
T. C. Breese, West Berlin, O.....	2d best piece rustic work with plants.....	\$5 00
Maurice Evans, Columbus, O.....	Best stump planted.....	5 00
same	" pair vases of living plants.....	10 00
same	" urn or vase planted.....	5 00

OUT DOOR ORNAMENTATION OF FLOWER BEDS.

Owner's name and address.	Name of article.	Premium.
S. B. Slack, Delaware, O.....	Best rustic house with seats for not less than ten persons	\$25 00

UTENSILS AND SUPPLIES FOR FLORIST GARDENERS.

Owner's name and address.	Name of article.	Premium.
Col. Frass & Steam Pipe Works Co., Columbus, O.....	Best hot water apparatus for heating green-house....	Medal.
Col. Brass & Steam Pipe Works Co., Columbus, O.....	" st'm heating apparatus for heating green-house	"
J. J. McMillen, Van Wert, O.....	" collection of dried natural flowers.....	\$5 ⁰⁰
Mrs. E. L. Charles, Columbus, O.....	2d " "	8 ⁰⁰
J. J. McMillen, Van Wert, O.....	Best arranged design of natural dried and preserved flowers	10 00

FORESTRY AND ARBORETUM.

Owner's name and address.	Name of article.	Premium.
— Frank, Ottawa, O.....	Best collection of seeds, etc.....	\$15 00
C. M. West, Columbus, O.....	" prepared birds and insects useful and injurious to forests.....	25 00
Emma J. Carl, New London, O.....	Best herbarium of leaves, etc.....	25 00
— Frank, Ottawa, O.....	" collection of diametric logs of wood showing grain, stating name and age.....	25 00
Thos. Mehan, Philadelphia.....	Best collection of hardy trees, shrubs and herbs indigenous to the forests of Ohio.....	Medal.
Columbus Nursery	2d best collection of hardy trees, shrubs and herbs indigenous to the forests of Ohio	Dip.

CUT FLOWERS—Continued.

Owner's name and address.	Name of article.	Premium.
Mrs. E. Souder, Toledo, O.....	Suspended design for weddings, etc.....	\$5 00
Mrs. Jos. Bradford, Columbus, O.....	2d " " " " " " " " " "	2 00
Miss Maggie Evans, Columbus, O.....	Arranged basket of cut flowers handled, etc.....	8 00
Mrs. J. M. Ingman, Marysville, O.....	2d " " " " " " " " " "	5 00
same	Cutest floral design for christening gift.....	5 00
Miss Maggie Evans, Columbus, O.....	Display garden flowers " " " " " " " " " "	15 00
Mrs. J. M. Ingman, Marysville, O.....	2d " " " " " " " " " "	8 00
Miss Jennie Coder, " " " " " " " " " "	Suspended floral design for weddings, etc.....	10 00
Mrs. J. D. Moury, " " " " " " " " " "	Corsage bouquet of pink roses.....	2 00
W. R. Sprague, Brice, O.....	2d " " " " " " " " " "	2 00
Mrs. J. D. Moury, Marysville, O.....	" " " " " " " " " "	1 00
Mrs. J. M. Ingman, " " " " " " " " " "	Best original and artistic design in cut flowers.....	25 00
Miss Maggie Evans, Columbus, O.....	2d " " " " " " " " " "	13 00
same	Best two memorial or funeral designs " " " " " " " " " "	26 00
Mrs. E. L. Charles, " " " " " " " " " "	2d " " " " " " " " " "	12 00
Miss Hattie Frazer, Franklin Park, O.....	Handsomest dinner table decoration " " " " " " " " " "	35 00
Mrs. J. M. Ingman, Marysville, O.....	2d " " " " " " " " " "	15 00
Miss Hattie Frazer, Franklin Park, O.....	Best artistic mantle decoration.....	15 00
Miss Jennie Coder, Marysville, O.....	2d " " " " " " " " " "	10 00
Miss Hattie Frazer, Franklin Park, O.....	Best room decoration suitable for weddings, etc.....	40 00
Miss Jennie Coder, Marysville, O.....	2d " " " " " " " " " "	20 00
Mrs. J. M. Ingman, " " " " " " " " " "	Best bridal bouquet " " " " " " " " " "	10 00
Miss Hattie Frazer, Franklin Park, O.....	2d " " " " " " " " " "	5 00

WOMEN'S WORK.

HOUSEHOLD FABRICS.

Owner's name and address.	Name of article.	Premium.
Mrs. Ella Speckman, Marysville, O.....	Best rag carpet.....	\$5 00
Mrs. David Killar, Lima, O.....	2d ".....	3 00
W. R. Sprauge, Brice, O.....	Best hearth rug.....	3 00
Mrs. Wm. Ritchey, Buffalo, Pa.....	2d ".....	2 00
same	Best yarn rug.....	3 00
Mrs. C. Hawley, Collamer, O.....	2h ".....	2 00
Mrs. L. G. Tuttle, Painesville, O.....	Best rag rug.....	3 00
Mrs. L. G. Little, ".....	2d ".....	2 00
Lena M. Wood, Gallipolis, O.....	Best pair woolen knit stockings or socks.....	2 00
Miss M. E. Gates, East Cleveland, O...	" linen " ".....	2 00
Emma J. Carl, New London, O.....	" cotton " ".....	2 00
Mrs. Sue Magee, St. Clairsville, O.....	" silk " ".....	2 00
Mrs. Henry Bieber, Delaware, O.....	" silk knit wristlets.....	1 00
Mrs. Sue Magee, St. Clairsville, O.....	" " mittens.....	2 00
Emma J. Carl, New London, O.....	Best specimen of darning.....	1 00
Lena M. Wood, Gallipolis, O.....	" cotton knit tidy.....	2 00
same	" " lace.....	1 00
M. F. Marshall, Columbus, O.....	" woolen knit lace.....	1 00
Mrs. Chas. Higgins, Columbus, O.....	" pair woolen knit gloves.....	2 00
Mrs. G. W. Pence, St. Paris, O.....	" " mittens.....	1 00
Susan J. Button, Litchfield, O.....	" stocking yarn.....	1 00
Mrs. Hattie Battenstine, Marion, O.....	" woolen knit shirt.....	3 00
Mrs. R. Schoenberg, Columbus, O.....	" foot mat.....	2 00
Mrs. E. G. Strong, Defiance, O.....	Best child's suit.....	Dip. or 3 00
Mrs. Wm. Holmes, Marion, O.....	2d ".....	1 00
Mrs. Geo. A. Pfaffman, Cleveland, O.....	Best bed spread.....	3 00
Union County.....	2d ".....	1 00
Mary Maxwell, Reynoldsburg, O.....	Best specimen of tatting.....	2 00

NEEDLE WORK.

Owner's name and address.	Name of article.	Premium.
L. M. Wright, Worthington, O.....	Best gent's shirt.....	\$2 00
Emma J. Carl, New London, O.....	" chemise.....	2 00
Mrs. Nancy Bieber, Delaware, O.....	" specimen hem-stitching.....	1 00
same	" pillow shams.....	2 00
Mrs. Belle Cross, Upper Sandusky, O.....	" pillow shams darned on tulle.....	3 00
Mrs. Mary Gardner, Columbus, O.....	" suit of lady's underwear.....	5 00
same	" lady's skirt.....	3 00
Mrs. B. Shaufl, Cadiz, O.....	" " nightdress.....	3 00
Mrs. A. H. Debellng, Cleveland, O.....	" bands and sleeves.....	1 00
Mrs. A. Schoenberg, Columbus, O.....	" handkerchief.....	1 00
Mrs. Maggie Pool, Reynoldsburg, O.....	" silk quilt, not embroidered.....	3 00
Mrs. H. E. Tracy, Portsmouth, O.....	" velvet quilt.....	5 00
Mrs. C. Mullett, Clark's, O.....	" white quilt.....	3 00
Mrs. Wm. Ritchey, Buffalo, Pa.....	" patch work quilt—silk or worsted.....	3 00
Mrs. L. S. Ross, Columbus, O.....	" patch work quilt—calico.....	3 00
Mrs. A. D. Reid, Cardington, O.....	" cradle quilt.....	2 00
Catharine Staley, Marysville, O.....	" spread darned on tulle.....	3 00
Mrs. Chas. Higgins, Columbus, O.....	" display of machine work.....	5 00
Mrs. R. Schoenberg, ".....	" display of hand needle work.....	5 00

SILK EMBROIDERY.

Owner's name and address.	Name of article.	Premium.
W. R. Sprague, Brice, O	Best piano cover	5 00
same	" table	5 00
Miss Clara Bieber, Delaware, O.....	" ottoman cover.....	4 00
Miss Hattie Miller, Columbus, O	" silk embroidered quilt	5 00
Sarah Wagenhals, "	" chair cover.....	4 00
Mrs. Wm. Holmes, Marion, O	" picture	3 00
Mrs. H. Finkbone, Kirkersville, O	" sacque	4 00
W. R. Sprague, Brice, O	" skirt.....	3 00
Mrs. A. H. Develing, Cleveland, O.....	" slippers	2 00
Sarah Wagenhals, Columbus, O.....	" scarf.....	2 00
Miss Clara Bieber, Delaware, O.....	" lambrequin for mantel.....	4 00
W. R. Sprague, Brice, O	" " bracket.....	2 00
Jessie Jackson, Columbus, O.....	" fire screen.....	2 00
Mrs. Chas. Higgins, Columbus, O.....	" sofa pillow.....	2 00
W. R. Sprague, Brice, O.....	" foot rest.....	2 00
Mrs. Chas. Higgins, Columbus, O.....	" shopping bag	2 00
same	" portfolio.....	2 00
Miss Mary Webb, Wooster, O.....	" single specimen of silk embroidery.....	3 00
Mrs. Chas. Higgins, Columbus, O.....	" display of silk embroidery.....	10 00

ART NEEDLE WORK.

Owner's name and address.	Name of article.	Premium.
Laura Zettler, Columbus, O.....	Best three panel fire screen.....	\$5 00
Sarah Wagenhals, "	" one "	5 00
Miss Carrie Stelzig, "	" piano cover.....	5 00
Mrs. Chas. Higgins, "	" scarf.....	4 00
Sarah Wagenhals, "	" table cover.....	5 00
same "	" scarf.....	3 00
Mrs. R. Schoenberg, "	" ottoman or foot rest.....	2 00
Miss Clara Bieber, Delaware, O.....	" pair floor pillows.....	5 00
Mrs. R. J. Snively, Columbus, O	" door panel	3 00
Sarah Wagenhals, "	" lady's dress	5 00
same "	" easel scarf.....	2 00
W. R. Sprague, Brice, O	" hand screen.....	2 00
Mrs. Chas. Higgins, Columbus, O.....	" picture frame.....	2 00
Sarah Wagenhals, "	" pair wall panels	3 00
Mrs. G. W. Wakefield, "	" side board cover	2 00
Lizzie Beckel, Defiance, O.....	" wall splasher.....	1 00
Mrs. M. Strauss, Elyria, O.....	" dozen doylies	3 00
Mrs. R. Schoenberg, Columbus, O	" set toilet mats (four pieces)	3 00
Miss Clara Bieber, Delaware, O.....	" towel.....	1 00
Mrs. Chas. Higgins, Columbus, O.....	" mantel lambrequin.....	4 00
Mrs. E. A. McCullough, Delaware, O.....	" throw or ornamental scarf	3 00
Mrs. R. J. Snively, Columbus, O.....	" sofa pillow.....	3 00
Society of King's Daughters, Tee- garden, O.	" bed spread.....	5 00
Mrs. Herb Brooks, Columbus, O	" afghan	4 00
Mrs. Chas. Higgins, "	" book cover.....	2 00
Mrs. R. J. Snively, "	" apron	1 00
Minnie E. Dean, Jefferson, O.....	" handkerchief case.....	1 00
Sarah Wagenhals, Columbus, O.....	" photograph case.....	1 00
W. R. Sprague, Brice, O.....	" specimen of art needle work.....	5 00
Lena Strothenk.....	" display of art needle work, not less than twelve pieces	20 00

TURKISH OR APPLIED EMBROIDERY.

Owner's name and address.	Name of article.	Premium.
Mrs. R. Schoenberg, Columbus, O.....	Best table cover.....	\$5 00
Mrs. Chas. Higgins, " "	" " scarf.....	3 00
Mrs. R. Schoenberg, " "	" sofa pillow.....	3 00
Mrs. Chas. Higgins, " "	" scrap basket.....	3 00

FRENCH AND SATIN STITCH EMBROIDERY—COTTON AND LINEN.

Owner's name and address.	Name of article.	Premium.
— McDonald, Granville, O.....	Best pillow shams.....	\$2 00
— same	" 6 handkerchiefs.....	2 00
W. R. Sprague, Brice, O.....	" yoke and cuffs.....	3 00
— same	" chemise.....	2 00
— McDonald, Granville, O.....	" night dress.....	3 00
Miss Minnie Bieber, Delaware, O.....	" suit lady's underwear.....	5 00
Mrs. J. M. Ingman, Marysville, O.....	" hem stitching on 2 dozen doilies.....	1 00
Laura Schilling, Columbus, O.....	" specimen of drawn work.....	4 00
W. R. Sprague, Brice, O.....	" display, cotton and linen.....	3 00
Mrs. R. Schoenberg, Columbus, O.....	" skirt.....	3 00

WORSTED, SILK AND CROSS STITCH.

Owner's name and address.	Name of article.	Premium.
Mrs. E. N. McCarter, Columbus, O.....	Best chair strip.....	\$3 00
Mrs. R. Schoenberg, " "	" sofa pillow.....	2 00
Miss Lizzie Magee, St. Clairsville, O.....	" pin cushion.....	1 00
Mrs. R. K. Enos, Millersburg, O.....	" foot rest.....	2 00
Mrs. A. McCloy, Elyria, O.....	" picture.....	2 00
Lizzie Bechet, Defiance, O.....	" tidy.....	2 00
Minnie E. Dean, Jefferson, O.....	" afghan.....	3 00
Mrs. R. Schoenberg, Columbus, O.....	" slippers.....	1 00
W. R. Sprague, Brice, O.....	" display not less than 5 specimens worsted, silk and cross stitch.....	5 00

OUTLINE EMBROIDERY.

Owner's name and address.	Name of article.	Premium.
Mrs. W. H. Meloy, Hudson, O.....	Best pair of pillow shams.....	\$3 00
Miss Laura Hardy, Marion, O.....	" wall splashes.....	2 00
— same	" tray cloth.....	2 00
W. R. Sprague, Brice, O.....	" dozen doilies.....	2 00
Mrs. Chas. Higgins, Columbus, O.....	" table scarf.....	2 00
W. R. Sprague, Brice, O.....	" table mats.....	2 00
Mrs. Chas. Higgins, Columbus, O.....	" mantel lambrequin.....	2 00
Miss Laura Hardy, Marion, O.....	" pair towels.....	1 00
Callie Fickey, Columbus, O.....	" tidy.....	2 00
Sarah Wagenhals, Columbus, O.....	" specimen.....	3 00

BRAIDING LACE AND WORK.

Owner's name and address.	Name of article.	Premium.
Miss Clara Bieber, Delaware, O.....	Best braided pillow shams	\$2 00
Mrs. Chas. Higgins, Columbus, O.....	" " carriage robe	2 00
Mrs. L. Trimble, Marion, O.....	" " skirt	3 00
Mrs. Ida Walcott, Elyria, O.....	" gold thread work.....	2 00
Mrs. Laura Hardy, Marion, O.....	" silver "	2 00
Mrs. M. Mullin, Columbus, O.....	" lace collar.....	2 00
Callie Fickey, "	" tatting collar.....	2 00
Mrs. Perry Juggers, Marysville, O.....	" display of tatting.....	3 00
Mrs. M. Mullin, Columbus, O.....	" lace handkerchief.....	3 00
same	" specimen of point lace	4 00
L. C. Leib, Columbus, O.....	" " macrame lace	4 00
Mrs. L. Trimble, Marion, O.....	" " gimpure lace.....	3 00
Mrs. Laura Hardy, "	" " darning on tulle	3 00
Mrs. R. Schoenberg, Columbus, O.....	" " wool lace	3 00
Mrs. M. Mullin, "	" display of lace work	5 00

CROCHET WORK.

Owner's name and address.	Name of article.	Premium.
Mrs. R. Schoenberg, Columbus, O.....	Best large afghan	\$2 00
Mrs. G. W. Pence, St. Paris, O.....	" child's "	2 00
Mrs. L. Trimble, Marion, O.....	" shawl	4 00
Mrs. G. W. Pence, St. Paris, O.....	" child's hood	2 00
Miss Jennie Coder, Marysville, O.....	" shoulder cape.....	2 00
Miss Minnie Bieber, Delaware, O.....	" nuba	2 00
Miss Lizzie Magee, St. Clairsville, O.....	" fascinator.....	2 00
Miss Ven. Wright, Columbus, O.....	" lady's sacque	2 00
Lena M. Wood, Gallipolis, O.....	" child's	2 00
Miss Lizzie Magee, Columbus, O.....	" wristlets	1 00
same	" infant's socks.....	1 00
Mrs. Mary Stiles, Richmond, O.....	" collar	1 00
Miss Lizzie Magee, Columbus, O.....	" chair tidy	1 00
Mrs. R. Schoenberg, "	" toilet set	2 00
Augusta Boalt, Milan, O.....	" set table mats.....	2 00
Mrs. R. Schoenberg, Columbus, O.....	" slippers	2 00
Miss Alice Ackley, S. Charleston, O.....	" purse.....	1 00
Maggie Adele, Columbus, O.....	" skirt.....	3 00
Lena M. Wood, Gallipolis, O.....	" wool lace.....	2 00
Miss Lizzie Magee, Columbus, O.....	" cotton lace.....	2 00
same	" display of crochet work not less than 10 pieces	10 00

MILLINERY AND MANTUA MAKING.

Owner's name and address.	Name of article.	Premium.
A. E. Davis & Son, Columbus, O.....	Best straw hat trimmed	\$2 00
Mrs. J. R. Shrum, "	" " bonnet trimmed	2 00
Miss Flattery, Lima, O.....	" 3 hats made and trimmed.....	4 00
A. E. Davis & Son, Columbus, O.....	" 3 bonnets made and trimmed.....	5 00
Mrs. J. R. Shrum, "	" lady's cap.....	2 00
A. E. Davis & Son, "	" house gown, silk.....	5 00
same	" tea gown.....	3 00
Mrs. Chas. Higgins, Columbus, O.....	" wrapper.....	3 00
same	" mantle.....	5 00
Mrs. J. R. Shrum, Columbus, O.....	" display of corsets	3 00
same	" skirt supporter	1 00
Mrs. Rose Luft, Columbus, O.....	" exhibit of domestic laundry work, hand	3 00

HOUSEHOLD ORNAMENTAL WORK.

Owner's name and address.	Name of article.	Premium.
S. M. Wright, Washington, O.....	Best specimen of hair work.....	\$3 00
Mrs. John Burwell, Lima, O.....	" " bead work.....	3 00
Mrs. S. G. Wilson, Columbus, O.....	" " leaf work.....	2 00
J. Mary Wenger, ".....	" " moss or lichen work.....	2 00
Mrs. A. G. Parr, Newark, O.....	Best artificial flowers.....	3 00
Mrs. M. Gardner, Columbus, O.....	" preserved flowers.....	3 00
Mrs. F. McCraskey, Collamer, O.....	" " ferns.....	2 00

PATCHING AND DARNING.

Owner's name and address.	Name of article.	Premium.
Susan S. Button, Litchfield, O.....	Best mending by lady under 70 years.....	\$2 00
Catharine Staley, Marysville, O.....	" " " over 70 ".....	3 00
Susan S. Button, Litchfield, O.....	" darned garments by lady under 70 years.....	2 00
Miss Jennie Frank, Marysville, O.....	" " stockings by girl under 16 ".....	2 00
Mrs. J. M. Ingman, ".....	" " lady " 70 ".....	2 00

PLANTS AND FLOWERS GROWN BY WOMEN.

Owner's name and address.	Name of article.	Premium.
Miss Jennie Coder, Marysville, O.....	Best collection and finest arrangement of plants.....	\$20 00
Mrs. J. M. Ingman, ".....	2d " " ".....	10 00
W. R. Sprague, Brice, O.....	Best single specimen plant.....	5 00
same	" collection of ferns.....	10 00
Miss Jennie Coder, Marysville, O.....	2d " ".....	5 00
same	Best single specimen fern.....	5 00
Mrs. J. M. Ingman, Marysville, O.....	" collection of variegated leaved plants.....	10 00
Miss Jennie Coder, ".....	2d " ".....	5 00
W. R. Sprague, Brice, O.....	Best single specimen variegated leaved plant.....	5 00
Lucy C. Breece, West Berlin, O.....	" collection of coleus.....	5 00
Mrs. J. M. Ingman, Marysville, O.....	" " begonias.....	10 00
W. R. Sprague, Brice, O.....	" single specimen begonia.....	3 00
Lizzie Miller, Pataskala, O.....	" collection of cactus.....	10 00
W. R. Sprague, Brice, O.....	" " geraniums.....	10 00
same	" " fuchsias.....	5 00
Mrs. J. M. Ingman, Marysville, O.....	" " ".....	3 00
Miss Jennie Coder, ".....	" six hanging baskets of living plants.....	5 00
W. R. Sprague, Brice, O.....	2d " ".....	3 00
same	Best single hanging basket of living plants.....	2 00
Miss Jennie Coder, Marysville, O.....	2d best single rustic ".....	2 00

DRAWINGS, PAINTINGS, ETC.—THE WORK OF WOMEN.

Owner's name and address.	Name of article.	Premium.
Mrs. H. E. Thompson, Westerville, O.	Best life size portrait in oil from photograph or other picture.....	\$10 00
Mrs. H. Olmstead, Cleveland, O.....	Best portrait in oil of animal, head or full figure.....	10 00
Helen E. King, ".....	" specimen of fruit or flower painting from nature in oil.....	5 00
Mrs. H. Olmstead, ".....	Best exhibition of paintings from nature in oil.....	20 00
Marie H. Detmer, Columbus, O.....	" landscape from nature in oil.....	10 00
Miss Helen Frazer, ".....	" specimen painting in water colors.....	10 00
Josephine Klippart, ".....	" landscape from nature (water colors).....	10 00
Miss M. Olmstead, Cleveland, O.....	" specimen fruit or flower painting (water colors).....	5 00
same.....	" exhibition of paintings from nature.....	15 00
same.....	" free hand crayon drawing.....	5 00

PAINTINGS UPON FABRIC.

Owner's name and address.	Name of article.	Premium.
Mrs. H. Olmstead, Cleveland, O.....	Best specimen painting on velvet or plush.....	\$5 00
Mrs. W. E. Miller, Elyria, O.....	" " " silk or satin.....	5 00
Jessie Crayton, Columbus, O.....	" screen, banner or drape on silk or satin.....	5 00
Mrs. O. F. Foster, Green Springs, O.....	" display of paintings upon fabric.....	10 00

CHINA PAINTING.

Owner's name and address.	Name of article.	Premium.
Carrie L. Hayes, Columbus, O.....	Best specimen portrait in china.....	\$5 00
same.....	" display of painting on china.....	10 00
Mrs. A. L. Vincent, Elyria, O.....	" specimen ".....	5 00
Miss Helen Frazer, Columbus, O.....	" plaque.....	5 00
Carrie L. Hayes, ".....	" six plates.....	5 00
Lizzie M. Farland, Oxford, O.....	" " cups and saucers.....	5 00
Carrie L. Hayes, Columbus, O.....	" vase or jar.....	5 00
same.....	" piece decorated pottery.....	5 00

DRAWINGS.

Owner's name and address.	Name of article.	Premium.
Miss M. Olmstead, Cleveland, O.....	Best shaded charcoal drawing from object.....	\$3 00
Kate E. Irwin, East Cleveland, O.....	" " crayon point drawing from object.....	3 00
Margaretta Kelly, Cleveland, O.....	" crayon picture, free hand.....	3 00

PHOTOGRAPHS AND MISCELLANEOUS.

Owner's name and address.	Name of article.	Premium.
Robertina Dyas, Columbus, O.....	Best specimen photograph, colored in water colors..	1st p.
Frankie Stedman, McConnellsville, O.....	" " ornamental penmanship.....	

PAINTINGS IN OIL—COPY.

Owner's name and address.	Name of article.	Premium.
Mrs. Jas. Mullens, Wooster, O.....	Best flower picture.....	\$3 00
Miss Lillian Bell, Columbus, O.....	" landscape	5 00

SCULPTURE, CARVING, ETC.

Owner's name and address.	Name of article.	Premium.
Miss Dorathea Graham, Delaware, O..	Best general display of carving in wood.....	\$10 00
Mrs. L. Backus, Columbus, O.....	2d best "	5 00
Mrs. L. S. Ross, Columbus, O.....	Best specimen hammered brass.....	3 00

SILVER AND BRONZE MEDALS AWARDED.

SILVER MEDALS.

Owner's name and address.	Name of article.
S. E. Wurst, Elyria, O.....	Collection of poultry.
Frank Saumenig, Springfield, O.....	Incubator hatching largest per cent. of chicks.
G. S. Singer, Cardington, O.....	Brooder.
Chas. Gammerding, Columbus, O.....	Collection of poultry.
Col. Brass & Steam Pipe Works, Columbus, O.....	Hot water apparatus for heating green house.
same	Steam heating apparatus for heating green house.
F. N. Clemans, Philadelphia, Pa.....	Collection of hardy trees, shrubs, etc.
Henderson, Harker & Hayden Manufacturing Co., Columbus, O.....	Carriage and coach lamps.
P. Hayden & Son, Columbus, O.....	Warm air furnaces and registers.
Col. Brass & Steam Pipe Works, Columbus, O.....	Display of heating apparatus, plumbers' goods and supplies, steam brass and pipe works.
Vogelgesang Furnace Co., Columbus, O.....	Heating and ventilating furnaces and registers.
Ohio Buggy Co., ".....	Carriages and light buggies.
E. N. Mather, ".....	Roller fronts and thimble skein.
Buckeye Buggy Co., ".....	Display of carriages and buggies.
Columbus Buggy Co., ".....	".....
Haydenville Mining and Manufacturing Co., Haydenville, O.....	Sewer pipe, terra cotta ware, brick, clay, etc.
Wassal Fire Clay Co., Columbus, O.....	Sewer pipe, brick, terra cotta, etc.
R. G. Thompson, White Cottage, O.....	Display coal, stone and iron ore.
American Association, Knoxville, Tenn.....	State Geological, etc., display.
James E. Emmitt, Waverly, O.....	Display building stone.
Pebbles Quarry Co., Scioto county, O.....	Sample of building stone.
J. Laudy, Cincinnati, O.....	Photographic composition.
J. F. Ryder, Cleveland, O.....	Display of photographs.
L. M. Baker, Columbus, O.....	".....
J. M. Elliott, ".....	Crayon portrait.
Krauss & Meehan, Columbus, O.....	Display carpets, curtains, etc.
Famous Shoe House, ".....	Display of boots and shoes.
Willimantic Linen Co., Willimantic, Conn.....	".....
Hasbrook, Orr & Byers, Columbus, O.....	".....
Eldridge & Higgins, ".....	".....
Simons Bros., ".....	".....
Standard Sewing Machine Co., Cleveland, O.....	".....
Bowe & Beggs, Columbus, O.....	".....
Charles Wege, ".....	".....
Butler, Steurwald & Co., Columbus, O.....	".....
G. W. Early, ".....	".....
A. B. Chase & Co., Norwalk, O.....	".....
C. D. Williamson, Columbus, O.....	".....
W. H. Grabs, ".....	".....
J. M. & W. Westwater, Columbus, O.....	".....
Val. Loewer, ".....	".....
Northwood Glass Co., Martin's Ferry, O.....	".....
Buckeye Glass Co., ".....	".....
The Weikel & Smith Spice Co., Philadelphia, Pa.....	".....
Batterson & Hensel, Columbus, O.....	Smyser automatic package making and filling machine.
E. O. Randall & Co., ".....	Paper hangings.
Muskingum Co., Zanesville, O.....	Paper hanging and decorations.
Ohio Furniture Co., Columbus, O.....	Display of woollen goods, canned goods, glass bottles, etc.
Columbus Cabinet Co., ".....	Display of furniture.
Ohio Coffee and Spice Co., ".....	".....
Freeman, Ha'm & McAllister, Columbus, O.....	Package coffee.
W. R. Kinnear & Co., ".....	Display of furniture.
Snyder, Chaffee & Co., ".....	Metallic ceiling.
Acme Cash Carrier Co., ".....	Display of confectionery.
F. E. Bright, Cleveland, O.....	Cash carrier—R. R. system.
M. T. Gleason, Columbus, O.....	Registering turn-stiles.
Mrs. Dr. T. G. Wormley, Philadelphia, Pa.....	Carriage and coach mountings.
Mrs. C. B. Stewart, Portsmouth, O.....	Drawings of poison crystals.
	Display of pottery, modeled, decorated and fired by the exhibitor.

SILVER MEDALS—Continued.

Owner's name and address.	Name of article.
Mrs. O. G. Parr, Newark, O.....	Silk exhibits, cocoons, etc.
Mrs. G. W. Bannon, Portsmouth, O.....	Exhibition in taxidermy.
Ohio State University, Columbus, O.....	" of college work.
Columbus Public Schools, Columbus, O.....	" school work.
Buchtel College, Akron, O.....	Display of college work.
Wesleyan College, Delaware, O.....	" "
Oberlin College, Oberlin, O.....	" "
Ohio University, Athens, O.....	Geometrical drawing.
Public schools, Cleveland, O.....	Display of school work.
same, Zanesville, O.....	" "
same, Kent, O.....	" "
same, Newark, O.....	" "
same, Springfield, O.....	" "
same, Circleville, O.....	" "
same, Chillicothe, O.....	" "
same, Cambridge, O.....	" "
same, Coshocton, O.....	" "
same, Mansfield, O.....	" "
same, Canton, O.....	" "
same, Lima, O.....	" "
same, Marysville, O.....	" "
same, Massillon, O.....	" "
same, Wadsworth, O.....	" "
same, Lancaster, O.....	" "
same, Portsmouth, O.....	" "
same, Ashtabula, O.....	" "
same, Marietta, O.....	" "
same, Bellaire, O.....	" "
same, Mt. Vernon, O.....	" "
same, Fostoria, O.....	" "
Columbus Art School, Columbus, O.....	Display of art school work.
Manual Training School, Cleveland, O.....	" manual training school work.
E. Franck, Oak Harbor, O.....	" Geology and Mineralogy.
same.....	Exhibit in commerce and transportation.
Wm. N. Whiteley Co., Springfield, O.....	Improvement in harvesting machinery.
James Ohlen & Sons, Columbus, O.....	Circular and band saws.
W. I. Wood, Williamsport, O.....	Saddle mare "Lassie."

BRONZE MEDALS.

Owner's name and address.	Name of fowls and article.
Jos. Farmer, Flushing, O.....	County collection of poultry.
H. A. Bridge, Columbus, O.....	Breeding pen of Brahmas mated for cockerels.
J. T. Bull & Bro., Westerville, O.....	" partridge Cochins mated for pullets.
O. E. Hemenway, New London, O.....	" Langshans mated for cockerels.
Chas. Gammerdinger, Columbus, O.....	" w. f. blk. Spanish mated for cockerels
Roy C. Russell, Mt. Gilead, O.....	" s. c. w. Leghorns "
same.....	" " mated for pullets.
F. & R. Hedden, Columbus, O.....	" s. c. br. Leghorns " cockerels.
Chas. Gammerdinger, Columbus, O.....	" " pullets.
H. A. Bridge, Columbus, O.....	" Plymouth Rocks " cockerels.
Perley Picketts, Barnesville, O.....	" " pullets.
Henry Turk, Elmwood Place, O.....	" black Javas mated for pullets.
H. A. Bridge, Columbus, O.....	" silver Wyandottes mated for pullets.
same.....	" " cockerels.
F. N. Clemans, Philadelphia, Pa.....	" black " "
Frank Saumenig, Springfield, O.....	I incubator hatching 2d largest per cent. of chicks.
same.....	2d best brooder.
Mary Maxwell, Reynoldsburg, O.....	2d best domestic yeast bread.
Mrs. M. Poole, ".....	" rye bread.
Mary Maxwell, ".....	" brown bread.
Mrs. L. N. Smith, Lindenville, O.....	" Graham bread.
Mary Maxwell, Reynoldsburg, O.....	" raised biscuit.
same.....	" sponge cake.
Columbus Nursery, Columbus, O.....	2d best collection hardy trees, shrubs, etc.
R. T. Dyas, Columbus, O.....	Photograph, colored in water.
Frankie Stedman, McConnellsville, O.....	Special ornamental penmanship.
Mary Maxwell, Reynoldsburg, O.....	2d best domestic fruit cake.
Philip Schwaderer, Green Camp, O.....	Draft stallion, "Bayard, Jr."
same.....	" filly 1 and under 2 years.
same.....	" " under 1 year.
Johnson & Co., Columbus, O.....	Display of soap.
Siebert & Lilley, ".....	" blank books.
Delaware Chair Co., Delaware, O.....	Antique, upholstered and double cane seat chairs.
Cornell-Phenegeer Chemical Co., Columbus, O.....	Surgical instruments, chemicals, etc.

BRONZE MEDALS—Continued.

Owner's name and address.	Name of article.
Orr, Hanna & Abbott, Columbus, O.....	Paints and painters' supplies.
Snow & Dill, Columbus, O.....	Shirts and underwear.
Jas. Pyle & Sons, New York, N. Y.....	Pearline (soap powder).
Van Allen Automatic Pitman Manufacturing Co., Rochester, N. Y.....	Automatic pitman for sewing machines.
Bellaire Glass Co., Bellaire, O.....	Display of glassware.
L. G. Dillon Soap Co., Zanesville, O.....	soap.
C. C. Shepherd, Columbus, O.....	Exhibit of models.
Central Ohio Paper Co., Columbus, O.....	Display of paper.
Columbus Rubber Co., ".....	Rubber, mill and mechanical goods.
Geneva Tool Co., Geneva, N. Y.....	Display of garden tools.
Shaw & Haywood, Beverly, O.....	" carriages and wagons.
Spiral Spring Buggy Wks., Grand Rapids, Mich.	Carriages and gear.
Columbus Chair Co., Columbus, O.....	Chairs and rockers.
Patent Sash Balance Co., Portsmouth, O.....	Window sash balance.
Hylas Wood, Marysville, O.....	Flour and meal chest.
C. H. Stratton, Salem, O.....	Jump seat for carriages.
Standard Coach Pad Co., Wooster, O.....	Harness and saddlery.
B. K. Bradshaw & Co., Columbus, O.....	Base burner for hard coal.
J. H. & F. A. Sells, ".....	Saddlery hardware.
J. W. Brooke, ".....	Combination flour and meal chest.
A. L. Yardley, ".....	Display of willow ware.
S. F. Smith, ".....	Strap couplings and breeching lifters for harness.
The Brown, Hinman, Huntington Co., Col., O.....	Display of hand, farm and garden tools.
Philip Kinzel, Columbus, O.....	" edge tools.
Rowan Bros., Chillicothe, O.....	" horse shoes.
Columbus Bolt Works, Columbus, O.....	Carriage forgings.
Columbus Door Bell Co., Columbus, O.....	Display of door-bells.
C. E. Hills, Columbus, O.....	Meat case.
Glock & Tallmadge, Columbus, O.....	Mechanics' tools.
Fremont Drop Forge Co., Fremont, O.....	Carriage harness.
Scioto Buggy Co., Columbus, O.....	Carriages and buggies.
J. W. Dann M'fg Co., ".....	Bent work for carriages.
Excelstor Seat Co., ".....	Buggy seats.
G. Schreyer, ".....	Hot-air furnaces and heating stoves.
Andrews Bros. & Co., Youngstown, O.....	Coal and iron ore.
Mahoning Co., ".....	Display of iron ore and limestone.
A. B. Griffin, Urbana, O.....	Geological formations.
Jackson county, Jackson, O.....	Display of coals and iron ore.
Peter Neff, Gambler, O.....	Diamond black from natural gas.
T. J. Thomas, Springfield, O.....	Best display of horse shoes.
Nelsonville Sewer Pipe Co., Nelsonville, O.....	Sewer pipe.
Columbus " Columbus, O.....	
Benj. L. Madden, Fultonham, O.....	Display of stoneware.
Clark & Bowen, Zanesville, O.....	Stoneware, jars, etc.
W. B. Harris & Bro., ".....	Building bricks.
T. B. Townsend & Co., ".....	
J. Downerd & Son, ".....	Display glass and building sands.
Edward Ellis, ".....	Molding and building sands and clay.
G. W. Kearns & Co., ".....	Flint glass bottles.
Kearns, Gorsh & Co., ".....	
J. W. Everall, Westerville, O.....	Drain tile, brick and clay.
J. L. Lawler, Minerton, O.....	Vinton county coal.
Denison University, Granville, O.....	Collection of old and rare books and model of Caesar's bridge.
Wilberforce University, Xenia, O.....	Exhibit of college work.
Mt. Union College, Alliance, O.....	" " " "
Public schools, Mt. Sterling, O.....	Display of school work.
" London, O.....	" " " "
" New Paris, O.....	" " " "
" Canal Fulton, O.....	" " " "
" Columbiana, O.....	" " " "
" Peninsula, O.....	" " " "
" Columbus Grove, O.....	" " " "
" Milford Centre, O.....	" " " "
" Poland, O.....	" " " "
" Perrysburgh, O.....	" " " "
" St. Clairsville, O.....	" " " "
" Hudson, O.....	" " " "
" Elyria, O.....	" " " "
" Waverly, O.....	" " " "
" Hicksville, O.....	" " " "
" Alpha, Greene county, O.....	" " " "
" Richwood, O.....	" " " "
F. G. Withott, Dayton, O.....	New seedling peach.
W. I. Wood, Williamsport, O.....	Saddle stallion "Diamond."
same	Diamond and 5 of his colts.
A. H. Smith, Burg Hill, O.....	Exchange of money.
T. F. McGrew, Jr., Springfield, O.....	Cochin breeding pen mated for cockerels.
J. R. Grieve, Lancaster, O.....	Ornamental wood work.

MECHANICS AND MACHINERY DEPARTMENT.

ALPHABETICAL LIST OF EXHIBITS.

Owner's name and address.	Name of article.
Albion Manufacturing Co., Albion, Mich.....	Agricultural implements, cultivators, drills, etc.
American Road Mach. Co., Kennett's Square, Pa.	Road machines, scoops, scrapers, etc.
Allen, S. L., & Co., Philadelphia, Pa	Agricultural implements, cultivators, plows, potato digger.
Aultman, C., & Co., Canton, O	Threshers, stackers, traction engines and mowers.
Aultman, Taylor & Co., Mansfield, O.....	Engines and threshers.
Allen Manufacturing Co., Chicago, Ill.....	Band saw machinery.
Birdsell Manufacturing Co., South Bend, Ind...	Clover separator.
Boomer & Boschert Press Co., Syracuse, N. Y.....	Cider press and evaporator.
Bickford & Huffman, Macedon, N. Y.....	Farmer's favorite grain drills.
Bradley, Holton & Co., Indianapolis, Ind.....	Agricultural implements, buggies, plows, rakes and cultivators.
Bucher & Gibbs Plow Co., Canton, O.....	Agricultural implements, plows, harrow pumps and hay carriers.
Beedle & Kelly Co., Troy, O.....	Wagons and planters.
Brown Manufacturing Co., Zanesville, O.....	" cultivators
Brown-Manly Plow Co., Malta, O.....	Plows and "
Bissell, F. H., & Co., Cambridge, Ind.....	Wire fence.
Band Saw (Novelty Co.) Chicago, Ill.....	.....
Bowers, M. S., Westerville, O.....	Threshers.
Bennet, H. L., "	Stump puller.
Barr, W. F., Brice, O.....	Gate.
Champion Wagon Co., Oswego, N. Y.....	Wagons.
Conde, H. F., Impt. Co., Indianapolis, Ind.....	Twine.
Columbus Wind Mill Co., Columbus, O.....	Wind mill.
Columbus Knitting Co., "	Knitting machine.
Centerburg Manufacturing Co., Centerburg, O.....	Grain cleaner.
Cummings, M. D., New Albany, O.....	Ornamental and farm fences.
Columbus Aret. Iron Co., Columbus, O.....	Iron fences and gates.
Comstock & Co., Columbus, O.....	Bottler's machine.
Columbus Electric Supply Co., Columbus, O.....	Electric "
Case Manufacturing Co., Columbus, O.....	Flouring mill machinery.
Campbell, J. D., Bell Center, O.....	Wire fence and patent fence post.
Coates, A. W., & Co., Alliance, O.....	Hay rakes.
Cartright Steam Boiler Co., Lawrence, Kas.....	Food cooker.
Chase Bros. Manufacturing Co., Findlay, O.....	Farm and drive gate.
Col. Brass & Steam Pipe Works Co., Columbus, O.....	Engines, mills and plumber's supplies.
Cleveland Dryer Co., Cleveland, O.....	Fertilizers.
Collins Manufacturing Co., Jackson, Mich.....	Road carts, road wagons and surrys.
Deeve & Co., Moline, Ill.....	Cultivators, plows, harrows, corn planters, potato diggers.
Davis Platform Binder Co., Cleveland, O.....	Platform binder.
Deering & Co., Chicago, Ill.....	Mowers, reapers and binders.
Economist Plow Co., Columbus, O.....	Plows.
Evans Manufacturing Co., Springfield, O.....	Corn planters and harrows.
Eureka Mower Co., Utica, N. Y.....	Mowers and reapers.
Elliott, J. F., Manson, Ia.....	Hog waterer.
Empire Harvesting Co., Akron, O.....	Mowers, reapers and binders.
Foss Manufacturing Co., Springfield, O.....	Feed mills and corn sheller.
Frank Wire Nail Co., Columbus, O.....	Wire nail machine.
Falls River & Machine Co., Cuyahoga Falls, O.....	Friction clutch pulleys.
Forest City Machine Works, Cleveland, O.....	Horse power.
Grim Manufacturing Co., Hudson, O.....	Evaporators.
Gale Manufacturing Co., Albion, Mich.....	Plows.
Garr, Scott & Co., Richmond, Ind.....	Traction engine, threshers and stackers.
Hoover & Gamble, Miamisburgh, O.....	Binders, mowers and twine.
Horn, W. H., Bellefontaine, O.....	Agricultural implements, etc.
Hoosier Drill Co., Richmond, Ind.....	Drills, corn planters and hay rakes
Huber Manufacturing Co., Marion, Ind.....	Traction engine and threshers.
Hydraulic Press Co., Mt. Gilead, O.....	Hydraulic cider press.
Rutcliffson, G. C., Sidney, O.....	Automatic gate.

ALPHABETICAL LIST OF EXHIBITS—Continued.

Owner's name and address.	Name of article.
Harrison, W. R., & Co., Canton, O.	Feed cutters.
Hocking Valley M'fg Co., Lancaster, O.	Corn shellers, feed mills and hay rakes.
Hartman Manufacturing Co., Romeo, Mich.	Road carts, fencing and floor mats.
Hoover & Fouts, West Milton, O.	Automatic grain scale.
Ideal Plow Co., Salem, O.	Plows, cultivators, field and lawn rollers.
Jefferson Iron Works, Steubenville, O.	Nails and nail machines.
Jeffrey Manufacturing Co., Columbus, O.	Elevators, single-truss and roller chains.
Johnston, W. M., Wilmet, O.	Pumps and folder binders.
Keystone Manufacturing Co., Sterling, Ill.	Hay rakes, pulverizer, corn planters, cider mills, corn huskers, corn sheller, hay ladder and hay tedder.
Kemp & Burke M'fg Co., Syracuse, N. Y.	Manure spreader.
Long, Allstatter & Co., Hamilton, O.	Cultivators, hay rakes and feed cutter.
Lehr Bros., Fremont, O.	Cultivators.
Long Bros., Hayessville, O.	Hay and grain elevator.
Lansing Iron Engine Works, Lansing, Mich.	Thrasher, engine and saw mill.
Lean, R., & Son, Mansfield, O.	Harrows.
Lagonda Manufacturing Co., Springfield, O.	Feed mills.
Lewis Hampton, & Co., Detroit, Mich.	Potato digger.
Luntz, Link & Co., Columbus, O.	Fruit extractor and carrier.
Livingston & Son.	Garden tools.
Moline Plow Co., Moline, Ill.	Agricultural implements, corn planters, plows, etc.
Mast, Foss & Co., Springfield, O.	Pumps, wind mills, fence, sprinklers, and lawn mowers.
Milwaukee Harvesting Co., Milwaukee, Wis.	Harvesters and mowers.
Morgan, D. S., & Co., Brockport, N. Y.	Agricultural implements, binders, mowers and reapers.
McCormick Harvesting Mach. Co., Chicago, Ill.	Agricultural machinery, binders, mowers and reapers.
Mossman, James, Westerville, O.	Wind mill.
McCherry & Co., Dayton, O.	Grain drills, harrows, pulverizers and seeders.
McNamar, J. H., Newark, O.	Traction engine.
Milford Cultivator Co., Milford, Mich.	Cultivators.
Minneapolis Harvest W'ks, Minneapolis, Minn.	Binders and mowers.
Minnesota Thresher Co., Stillwater, Minn.	Engine thrasher and wagons.
Maygard, J. H., & Co., Iowa City, Ia.	Automatic grain measurer.
Moline Wagon Co., Moline, Ill.	Wagons.
Mast, P. P., & Co., Springfield, O.	Grain drills, cultivators, cider press and hay rakes.
Monitor Manufacturing Co., Auburn, Ind.	Wind mill.
Miller, L., Delaware, O.	Road carts.
Mix, N. P., Columbus, O.	Automatic circular saw sharpener and gummer.
Motherwell Iron & Steel Co., Logan, O.	Cultivators.
Miller, C. A., Urbana, O.	
Nixon Nozzle Machine Co., Dayton, O.	Spraying machinery.
Newark Machine Co., Columbus, O.	Manure spreader, clover huller, straw stackers, etc.
Osborne Co., Auburn, N. Y.	Harvesting machines, binders and mowers.
Orville Machine Co., Orville, O.	Combined thrasher and clover huller.
Pease, C. G., Concord, Lake Co., O.	Turning lathe.
Potter, H. I., Leonardsburgh, O.	Ditching machine.
Plano Manufacturing Co., Chicago, Ill.	Binders and mowers.
Princess Plow Co., Canton, O.	Plows and ladders.
Powell, C. H., Zanesville, O.	Wagons.
Roley Bros., Basil, O.	Rollers.
Rock Island Plow Co., Rock Island, Ill.	Plows and cultivators.
Rude Bros. Manufacturing Co., Liberty, Ind.	Cultivators, corn and grain drills.
Root, A. J., Medium, O.	Honey box machinery.
Barig & Co., Columbus, O.	Stomping rollers.
Riegel, S. D., Thomasville, Ga.	Picket and slot machinery, ornamental wood patterns.
Russell & Co., Massillon, O.	Engine thrasher and stacker.
Beeves & Co., Columbus, Ind.	Engine and stacker.
Barig, Alex. K., & Co., Columbus, O.	Engines.
Schrock & McDona'd, Columbus, O.	Grain drills, etc.
Springfield Fertilizer Co., Springfield, O.	Fertilizers.
Scheldler Machine Works, Newark, O.	Traction engine and separator.
South Bend Chilled Plow Co., South Bend, Ind.	Plows.
Surguy & Co., Columbus, O.	Stereotyping and printing.
Sidney Steel Scraper Co., Sidney, O.	Sleds and scrapers.
Star Manufacturing Co., New Lexington, O.	Feed mills.
Stoddard Manufacturing Co., Dayton, O.	Grain drills, corn planters, hay rakes, harrows, etc.
Springfield Harrow Co., Springfield, O.	Harrows.
Superior Drill Co., Springfield, O.	Drills, corn cultivators, cider mills, hay carriers, etc.

ALPHABETICAL LIST OF EXHIBITS—Continued.

Owner's name and address.	Name of article.
Staver Implement Co., Chicago, Ill.....	Feed mills.
Suberling & Co., J. F., Lewisburg, O.....	Wind mill.
Smith & Woodard, Kalamazoo, Mich.....	Fence loom.
Steene, J. B., Fidelity, O.....	Plows.
South Bend Iron Works, South Bend, Ind.....	Traction engines.
Union Iron Works, Newark, O.....	Corn planters.
Vanderveer Corn Planter Co., Quincy, Ill.....	Portable fence and digger.
Wygant, J. C., Outville, O.....	Binders and mowers.
Wood, Walter A., Hoosic Falls, N. Y.....	Agricultural implements.
Whiteley, Wm., & Co., Springfield, O.....	Feed mills.
Waldron & Sprout, Muncie, Pa.....	Fence posts, etc.
Walters, J. W. & C. K., Mt. Vernon, O.....	Fence loom.
Williams Fence Co., Economy, Ind.....	Stock pump.
Wilkins, M. W., Corvalla, Ore.....	Faulders' supplies.
Watkins, Pease & Co., Columbus, O.....	Stock rack.
Young, John, Kirby, O.....	

CARRIAGE AND BUGGY DEPARTMENT.

ALPHABETICAL LIST OF EXHIBITS.

Owner's name and address.	Name of article.
American Churn Co., Toledo, O.....	Churns, butter workers, etc.
Acma Cash Carrier, Columbus, O.....	Cash carrier.
Brooks & Blasier, Columbus, O.....	Flour and meal chest.
Brobst Bros., ".....	Washing machines.
Bennett, H. L., Westerville, O.....	Stump puller and slat fence.
Buckeye Buggy Co., Columbus, O.....	Carriages and buggies.
Bradley, Holton & Co., Indianapolis, Ind.....	Carriages.
Bradshaw, S. K. & Co., Columbus, O.....	Stoves.
Collins Manufacturing Co., Jackson, Mich.....	Road and speed carts.
Columbus Buggy Co., Columbus, O.....	Carriages and buggies.
Columbus Bolt Works, ".....	Carriage forging.
Chase Bros., Findlay, O.....	Farm and drive gate.
Col. Brass and Steam Pipe Works, Columbus, O.....	General display.
Capital City Mantle Works, ".....	Slate mantles.
Columbus Chair Co., ".....	Chairs and rockers.
Col. Architectural Iron Works, ".....	Gate and fencing.
Campbell, J. D., Belle Center, O.....	Portable fence and posts.
Carter, J. S., Syracuse, N. Y.....	Creameries, churns, butter workers and packages.
Cummings, M. D., New Albany, O.....	Fence.
Cherrington & Robinson, Columbus, O.....	Seals, stencils, etc.
Columbus Door Bell Co., ".....	Door bells.
Cleary, Michael, Marion, O.....	Horseshoes.
Dandy Manufacturing Co., Columbus, O.....	Buggy wrench.
same.....	Wagon and buggy dash.
Excelsior Seat Co., Columbus, O.....	Buggy seats.
Fremont Dross Forge Co., Fremont, O.....	Carriage hardware.
— Ferguson, Ann Arbor, Mich.....	Road carts.
Grosgear, J. E., Fredericksburg, O.....	Funeral supplies.
Glock & Tallmadge, Columbus, O.....	Mechanics' tools.
Gleason, M. T., ".....	Carriage and hearse lamps and mountings.
Geneva Tool Co., Geneva, O.....	Hand agricultural tools.
Hayden, P. & Son, Columbus, O.....	Warm air furnaces and registers.
Henderson, Harker & Hayden Manufacturing Co., Columbus, O.....	Display carriages, coach and hearse lamps.
Hammon, F., Cincinnati, O.....	Cleaning compound.
Hayden, P., Saddlery Hardware Co., Columbus, O.....	Display chains and hames.
Hinkle, Hamar, Shreve, O.....	Inlaid dressing case.
Hutchinson, G. C., Sidney, O.....	Automatic gate.
Hatcher, E. N., Columbus, O.....	Boiler fronts and thimble skeins.
Hills, C. P., Delaware, O.....	Meat case.
Hunter & Smith, Delaware, O.....	Screw and bolt case.
Halley, Wm. & Son, Columbus, O.....	Bath room plumbing.
Kimball, Andrew, Zanesville, O.....	Carriage gear woods.
Kinnel, P. H., Columbus, O.....	Edge tools.
Langhenry, Christ, Westerville, O.....	Cabbage cutters.
Morrow Bros. Mfg. Co., Washington C. H., O.....	Bridge collar pad.
Mosley & Stoddard, Poultney, Vt.....	Creameries, churns, etc.
Milford Manufacturing Co., Milford, O.....	Carpet sweeper.
Miller, D. W., Columbus, O.....	Kitchen tables.
Mars, C., Bloomsburg, Pa.....	Dog power and washing machines.
Mercantile Manufacturing Co., Cleveland, O.....	Folding chairs and clothes wringers.
Mantonya, E. D., Utica, O.....	Washing machines.
Mann, J., Manufacturing Co., Columbus, O.....	Bent woods.
Masters, A. & Co., Columbus, O.....	Washing machines.
Miller, L., Delaware, O.....	Road carts.

ALPHABETICAL LIST OF EXHIBITS—Continued.

Owner's name and address.	Name of article.
Ohlen, James & Sons, Columbus, O	Display of saws.
Ohio Buggy Co., "	Carriages and buggies.
Patent Sash Balance Co., Portsmouth, O.....	Window sash balance.
Patton, R., Columbus, O	Window weight and balance.
Rowen Bros., Chillicothe, O.....	Horseshoes.
Recknagel & Co., New York, N. Y	Washing machine.
Rockey, L. O., Columbus, O.....	Flour bin.
Shaw, H. A., Galena, O.....	Washing machines.
Smith, S. F., Columbus, O.....	Breast collars and neck strap couplings.
Schreyer, G., "	Stoves, furnaces and steel skeins.
Scioto Buggy Co., Columbus, O.....	Carriages and buggies.
Shaw & Hayward, Beverly, O.....	Carriages and wagons.
Spiral Spring Buggy Works, Grand Rapids, Mich	Carriages and gear.
Stratton, C. H., Salem, O	Jump seat carriages.
Sawbrey, Geo. J., Columbus, O.....	Folding pocket stool.
Snyder, Chaffee & Co., Columbus, O.....	Confectionery.
Standard Coach Pad Co., Wooster, O.....	Harness, etc.
Sells, J. H. & F. A., Columbus, O.....	Harness, robes and saddles.
The Brown-Hinman-Huntington Co., Colum- bus, O.	Display of hand, farm and garden tools.
The W. H. Fish Mfg. Co., Columbus, O.....	Irons for carriages.
Troy Buggy Works, Troy, O.....	Carriages and buggies.
Unger, Wm., Wooster, O.....	Patent quail horse brush.
Vermont Farm Machine Co., Bellows Falls, Vt.	Creameries, churns, butter workers, etc.
Vogelgesang Furnace Co., Columbus, O.....	Furnaces and registers.
Westwater, J. M. & W., Columbus, O.....	China and plate ware.
Wood, Hylas, Marysville, O.....	Flour and meal chest.
Yardly, H. L., Columbus, O	Wood and willow-ware.

AWARDS—BICYCLE RACES.

ENTRIES FOR ONE MILE RACE FOR A PRIZE MEDAL.

B. Chandler	Columbus, Ohio.
H. M. Steinberger.....	" "
Ed. Dame	" "
W. H. Armstrong	" "
W. R. Burris.....	" "
N. Stutson.....	" "
N. A. Ware.....	" "
H. Barrett.....	" "
H. Shields.....	" "
D. Higley.....	Washington C. H., O.

First prize to D. Higley. Time, 3:22. Second prize to W. R. Burris.

ENTRIES FOR SEVEN-EIGHTHS MILE SLOW RACE FOR A PRIZE L. A. W. PIN.

Gus Peters	Columbus, Ohio.
P. Chandler.....	" "
N. Stutson.....	" "

Prize to Gus Peters. Time, 4:33.

ENTRIES FOR ONE-HALF MILE SAFETY RACE FOR A PRIZE MEDAL.

W. R. Burris.....	Columbus, Ohio.
S. E. Ranney	" "
R. L. Seeds.....	" "

Prize to W. R. Burris. Time, 1:40.

ENTRIES FOR TWO-MILE RACE, OPEN TO ALL—PRIZE, TWO BADGES.

W. R. Burris.....	Columbus, Ohio.
H. Shields.....	" "
R. L. Seeds.....	" "
N. L. Crabill.....	" "

First prize to W. R. Burris. Time, 8:20. Second prize to R. S. Seeds. Time, 8:25.

ENTRIES FOR MILE RACE.

W. L. Crabill.....	Columbus, Ohio.
B. Chandler	" "
E. W. Dann.....	" "
N. Stutson.....	" "

First prize to N. Stutson. Time, 3:40.

H. A. BRIDGE, *Superintendent.*

FRANK WEAVER,
J. F. SEAMAN,
J. H. GRAVES, } *Judges.*

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APPENDIX.

THIRD ANNUAL REPORT

OF THE

Ohio Dairy and Food Commission,

TO THE

GOVERNOR OF THE STATE OF OHIO,

FOR THE YEAR 1888.

1 A. Appendix.

Report of the Commissioner.

To the Governor, HON. J. B. FORAKER :

In compliance with the statute, I have the honor to submit my first annual report of this department, and the third in its history.

It should be said that when your Excellency called me to the head of this commission, November 15, 1887, very many of the embarrassments and difficulties that had met my predecessor had been removed. The work had been organized and projected, the people fully informed of its aims and interested in its purpose. Convictions had been secured in different sections of the State and many abuses corrected. A most serious obstacle was encountered, however, at the outset. The constitutionality of our law was called in question in the H. B. West case in Cleveland. This case was pending nearly the entire winter, and is so fully set forth in Mr. Talcott's accompanying report that it only remains to be said that it was considered unwise to begin new prosecutions, except for the most plain violations.

The General Assembly of 1888 greatly increased the efficiency of the department by the enactment of a law giving final jurisdiction to mayor's courts and to any justice of the peace. Parties who had violated the food laws, hoping to escape the penalties through the delays incident to securing indictments and a trial in the criminal courts, were now unwilling to appear in these more available courts for final hearing. A number of prompt convictions in Cleveland, Columbus, Springfield and Toledo were followed by an increased respect for the law. This provision has proven invaluable. Yet it is suggested that it be so amended as to decide a question that has been raised as to whether the jury to which the defendant is entitled in a justice's court shall consist of six men with a compensation of fifty cents, or of twelve men at two dollars per day. At the same session the vinegar law of 1887 was so amended as to forbid the coloration of all vinegar. This, in substance, was an absolute prohibition of the manufacture and sale of distilled vinegar in imitation of cider vinegar. The law took effect upon its passage, subjecting any who violated its provisions to heavy penalties, and the stock to forfeiture and spoliation.

Estimates of brokers and commission men placed the amount of spurious vinegar on the market of Ohio at from 100,000 to 500,000 barrels.

After going over the ground it was thought that the estimate was not exaggerated. It was found that nine-tenths of the stock was distilled from corn, and colored to imitate the product of the apple, and was purchased by the consumer in the belief that it was cider vinegar. Corn vinegar is in its natural form, white, but by the addition of burnt sugar, or other matter, is so changed in its appearance as to almost defy detection. It can be afforded at from two cents to eight cents per gallon. It was found also, that many thousands of bushels of apples had been left in the orchards of the State to rot, and that thousands of barrels of cider-vinegar were shelved in Ohio, unable to compete with the cheaper products. After anxious consideration the Commission did not feel willing to destroy this large amount of property. It was manufactured before the law was enacted, and although a fraud, there was a division of opinion as to its being injurious to health. Manufacturers were, therefore, asked to withdraw the spurious vinegar from the State. There were eight manufacturers in Ohio, besides large consignments from other States. The demand for withdrawal met with spirited opposition, but after much discussion the bulk of the stock was reshipped. It has been necessary to visit almost every town and city in the State and personally inspect the vinegar. Many car loads have been returned to Chicago, Kentucky, Michigan, Pittsburg and other points. No prosecutions have been made, although several stocks of colored vinegar have been turned in the sewer, but not unless placed since the passage of the law, or reshipment refused. The law seems to be a just one, since the value of the vinegar is not decreased, unless in its ability to deceive. In its present form, the consumer can tell at a glance its character and refrain from its use or purchase if disposed to prejudice. Large quantities of cider have been manufactured the past season, and it is not thought any inconvenience will follow the enforcement of the law when the trade is adjusted to the new conditions. It would be a relief if the Legislature would instruct the officer how to proceed if the dealer objects to a seizure of stock found to be spurious.

MAPLE SYRUP.

Mr. Talcott's prosecution of Mr. Wise, in the east part of the State for adulterating syrup, and the prosecution of Mr. J. W. Lindsey & Son in Cincinnati, by Mr. Geghan, proved so disastrous to the defendants, that it is hardly probable that the crime will be repeated in Ohio while the present law is in force. There is very little syrup on the market in violation of law, and this little will soon be corrected.

CANDY.

The increasing anxiety as to the danger arising from the use of candy, with the fact that almost all children, as well as many adults, used it, seemed to demand a careful examination. It was charged that poisonous matter was used for coloring, and that injurious and worthless ingredients were added for weight. Samples of candy were purchased on the markets of Cincinnati, Columbus, Cleveland and Toledo, and submitted to the State Chemist for analysis. The result, as will be seen by Prof. Weber's accompanying report, does not seem to justify the wide-spread apprehension of our citizens. No adulterations of terra alba, berytes, talo, or other mineral substances were found. The coloring-matter in the hands of manufacturers corresponded to that found by analysis. A few samples showed slight traces of analine, which, of course, cannot be too strongly condemned. To set the matter at rest four tame rabbits were procured, separated, and, under the eye of the Professor, for some weeks fed upon the coloring matter. To relieve whatever feeling may exist it may be said that, while rabbits are supposed to be very susceptible to poison, these seemed to experience no inconvenience from their treatment. The report shows that glucose has come into general use in the manufacture of candy.

SUGARS.

The use of sugar has become so general that it finds its way, in varying quantities, into every house. Influenced somewhat by frequent inquiries concerning sugars, and believing that an examination would be attended with great interest by the consumer, it was decided to make as fair and thorough an investigation as was possible. It was ascertained that four (4) cities of the United States furnished substantially all the sugar on our markets. A full line was selected from the leading refineries of Boston, Philadelphia, New York and New Orleans. These samples were bought from the barrels of retailers, wholesale houses, and samples from brokers, and all, 35 in number, placed in the hands of the Chemist. His report herewith, together with his remarks on the manufacture of sugar and glucose, cannot fail to be of general interest. It is exceedingly gratifying to note the entire absence of glucose, adulterations for weight, or of anything injurious to health. The sugars of the country seem to be absolutely pure and as represented. It is quite likely that the stringent laws recently enacted, with officers to enforce them, have had, and will continue to have, a wholesome effect. If the investigation has borne no other fruit, it will, doubtless, relieve the consumer of the thought that he is being defrauded, and in its stead will assure him that he is receiving that

for which he pays. Sugars from the refineries of San Francisco do not find their way so far east as Ohio, at least they were not found on our market. The experience of the Sorghum Sugar Works at Fort Scott, Kan., promises well for the future.

The chemist of the works, in his report of the three months just closed, says: "The output at the end of the year will be 100,000 galls. syrup, 500,000 lbs. pure sugar, which, with the (2c.) two cents bounty per pound offered by the State, makes it a paying business."

SACCHARINE.

Scientific circles are considerably stirred at present over a new product obtained from coal tar. It is claimed to be 300 to 400 times sweeter than cane sugar. It is looked upon with suspicion, and charged with being an antiseptic. The readiness with which it can be used as an adulterant, led Professor Weber to analyze several samples of glucose syrup, but the new substance was not found. It will, no doubt, give the chemist and medical fraternity no rest until its character is established.

A late issue of the "Anti-Adulteration Journal" has an article compiled from the writings of eminent authors, by Hugh Hall, which is of so much interest concerning this whole subject, that it is given a place here:

SUGAR.

Sugar, in the form with which we are most familiar—the so-called "cane-sugar"—has been known and used from the most remote ages in India and China, the very name coming down to us through the Arabic or Persian language, and it is known as "sukkar" in Arabia at the present day. The "Calamus" and "sweet reed" of the Bible are also supposed to refer to the sugar cane.

The manufacture of sugar came slowly into Europe, entering by way of Venice in the tenth century. Strabo, Arian, Pliny and others had already mentioned in their historical accounts of the nearer Orient the occurrence of a plant—undoubtedly the cane—which yielded a syrup that was eaten as honey with bread, and was brought originally from India and Ethiopia.

Pliny says further that it was called "Saccharum," and that sometimes when allowed to flow from the bruised plant, it would form a white solid substance resembling salt, which was used as a medicine. The early Crusaders found the Syrians indulging in a sweet juice "extracted from a cane which they broke up in mortar and sometimes allowed this extract to stand in the sun and evaporate, when a whitish substance separated out, which was eaten with bread." The Crusaders got some of the seed, and bringing back samples of the cane, they introduced its cultivation into Rhodes, Sicily and Crete in the ninth century. Thus spreading from the Levant as a starting point, the process of manufacture reached Venice in 996, Spain and Portugal coming next, and finally, in 1319, sugar became an article of importation into Great Britain in considerable quantity.

It is by no means improbable that the Spaniards found the sugar cane already growing when they discovered the West Indies. At any rate, with their wonderful adaptability of soil and climate, and the subsequent introduction of slave labor, they soon came into complete control of the sugar markets, and in the sixteenth century, India Europe

and the Mediterranean islands were driven out of all competition, and their manufactures languished.

There are three chief saccharine substances, differing slightly in chemical composition, which are more or less familiar to us. They are called "cane sugar," "grape sugar" and "milk sugar." The last gives to milk its sweet taste, and is found only in that animal secretion, of which it constitutes from 3 to 10 per cent. It is made from whey on quite a large scale among the mountain dairies of Switzerland, and finds its chief use as a vehicle for homeopathic medicines, and in some localities as an article of food. It is white, hard and brittle.

Grape sugar, called also "glucose," is undoubtedly the most abundant and widely distributed in nature of the three forms of sugar. It gives to almost all fruits their sweet taste, and is the main cause of the sweetness in nearly all our cultivated vegetables. It can, moreover, be made artificially from starch by a very simple process, and yields readily to fermentation, forming alcohol, and on this account it is coming more and more into demand for the manufacture of beer and alcoholic liquors. It is not crystallizable.

Cane sugar is to every one a familiar friend and needs no description. It is the most common of all our so-called luxuries; the last we give up when compelled to economize. It is claimed by some political economists that the consumption of sugar will give a very fair idea of the wealth and prosperity of a people.

Unlike grape sugar, cane sugar is produced by comparatively few plants, in sufficient quantity to render its extraction profitable; the sugar cane, Chinese cane (or sorghum), the sugar maple, a few species of palm, and the sugar beet being the only members of the vegetable kingdom from which it is obtained in any quantity. Nor can it be made artificially. Of the above-mentioned sources of cane sugar, sugar cane supplies 66 per cent., sugar beets 28 per cent., the palms 5 per cent. and the maple 1 per cent.

SACCHARINE.

In a paper recently read before the Paris Academy of Medicine, I find the following valuable information in reference to saccharine:

"A large number of people are incapable of distinguishing between liquids sweetened respectively with saccharine and sugar in the proportion of 1 to 280. This experiment has been often repeated, and in nearly every case with the same result. A few, whose taste is more delicate, can always detect a peculiar after taste from the solutions of saccharine, but these are exceptions. But though the taste of man generally is insufficient to detect the difference, it is otherwise with insects, etc. Ants, flies and wasps turn from substances sweetened with saccharine, and Fisher and Rabow have reported that in a confectioner's shop infested by wasps, cakes wetted with a solution of saccharine alone remained untouched. Bees appeared to have an absolute aversion to saccharine, and evince great irritation if it be repeatedly offered to them.

"Mixed with the food of dogs in doses of twenty or thirty grains, saccharine does not apparently modify any of the functions; it communicates a very sweet taste to the urine, and saccharine is found to be present unchanged in that excretion. With rabbits to which doses of 220 grains were administered, the same results were noted. One of the two dogs on which Salkowski experimented, showed, at the end of five days, so extreme a disgust for the sweetened food, that further experiment was prevented. Salkowski himself experienced no inconvenience from doses of 1.5 grain *per diem*, but the duration of the best is not stated. The elimination by the kidneys commences within half an hour from ingestion, and is completed within twenty-four hours. No trace is discoverable in the milk or saliva.

"Information as to the manner in which the public tolerate saccharine in the countries through which it is spreading, is at present not obtainable, nor can such be expected till injurious effects are definitely traced to their source. Doctors who have experimented with saccharine on themselves, agree, generally, in saying that they have exper-

ienced but little inconvenience therefrom. Several interesting particulars have been furnished of the effects of saccharine observed among various invalids in different hospitals. The most interesting is that given by Stadelman, of Heidelberg, who began his researches at the request of M. M. Fahlberg and List. He reports eleven observations relative to persons aged from fifteen to thirty-five years. In six cases the illness is not indicated, three were syphilitic, and two were attacked with chronic cystitis. These different individuals took relatively large doses of saccharine, from fifty to eighty grains per day, during two or three weeks. Out of this number, nine experienced no harmful effect, but with the other two there was nausea, violent pain in the stomach and loss of appetite. Dr. Stadelman experimented upon himself with a saturated solution, slightly alkalized, taking a dose of half a grain in 200 parts of water, and also with pastilles of English make. He varied the mode of administration by taking a like quantity in tea or coffee, either *noir* or *au lait*, in which he found it equal to 460 times as much sugar. He successively advised this mode of sweetening for tea and coffee to four persons who were diabetic in different degrees, for whom the deprivation of sugar was very trying. Three times out of four the result was unfavorable; digestive troubles arose, and he was obliged to suspend the use of saccharine. It appears beyond doubt that, as a rule, diabetic patients can only endure the ingestion of saccharine for eight or ten days, and that, when continued, it leads to loss of appetite, nausea, stomachic pains, and occasionally a taste of sugar in the mouth. There is a great interest, from the industrial point of view, in watching what place saccharine will take in public consumption. If it can be tolerated as well as cane or beet root sugar, its rapid success appears assured; if, on the contrary, it becomes injurious after slightly prolonged usage, as Dr. Stadelman is inclined to think, it is of the greatest importance to watch and limit its production. It is for the doctors and chemists to pursue the study of this grave problem in the interest of public health."

MILK.

The Board of Health of this city has a milk standard requiring not less than 12 per cent. solids, of which not less than 3 per cent. shall be fat. The milk inspector, Mr. Vause, has been tireless in his efforts to secure pure milk. The Board, in connection with this department, has secured a number of convictions and published many analyses. Many citizens have assured me that the milk supplied them has improved 25 per cent. during the year. Cases are pending in different parts of the State against dairymen for watering milk. It is recommended that the legislature fix a milk standard of at least $3\frac{1}{4}$ per cent. fat and $12\frac{1}{2}$ per cent. solids. New York has a standard of 3 per cent., Minnesota of $3\frac{1}{2}$ per cent. Many thousands of analyses or tests, in New York and Minnesota, show that average milk contains more than $3\frac{1}{2}$ per cent. of fat. Adulterated milk sold to factories or creameries is a fraud, and should meet with punishment. Detection is almost certain, however, as factorymen are provided with instruments for testing, and those sending suspicious milk are watched. Adulteration of milk sold to families is a crime, which, no doubt, often amounts to murder. Who can tell how many infants and invalids have succumbed to the cupidity of the milk seller? The standard suggested, or even as high as $3\frac{1}{2}$, would certainly contribute to the health of the people, and to the prosperity of the honest dairyman.

CHEESE.

It is not known to the commission that any adulterated cheese has been sold in the State during the year. Poor, skimmed cheese are on the market, but, if properly branded, they are not interfered with. It is charged that the skimmer hinders Ohio from taking that rank as a cheese producing State to which she is entitled. There can be no doubt that if Ohio cheese were placed on the market, showing uniform grade and good stock, it would not meet that neglect noted under the present conditions. There is an element of injustice shown in the efforts of some buyers to fix the price of milk by the price of "Ohio skimmed cheese."

OLEOMARGARINE.

In the arrest and conviction of Robert Bell last winter for using oleomargarine in his hotel in violation of law, it was disclosed by analysis that Phill. Armour's "creamery butterine" is composed of 85 lbs. of raw tallow and lard, 5 lbs. of dairy product, and 10 lbs. water to the hundred. Giving the majority the preference, the term "oleo" will hereafter be used when referring to imitation butter. The report of the commissioners of internal revenue, a synopsis of which has just been given to the press, gives the output of oleo for the year at 69,000,000 pounds, and the *reported* sales at 42,000,000, adding that it is a matter of great solicitude to the commissioners as to what has become of the large balance of 27,000,000, which he says has not been exported. The consumer and producer of natural butter share in that solicitude. A just and reasonable inference is, that, notwithstanding the laws, and officers for their enforcement, this large balance has been sold to the consumer as pure butter. Again, the report says, "There is an increase in the demand, both at home and abroad, and of course an increase in the manufacture." This announcement awakens the most lively interest. If it means anything, it is that oleo has started out to accomplish by strategy and the slow process of a siege, what it well-nigh accomplished by assault from 1876 to 1886, viz., the extermination of the dairy interests of the country. Will it succeed? Its friends claim for it two immense advantages. 1st. That in its present form it is, in appearance, a perfect, successful imitation of natural butter. This claim must be admitted, as a word will show. In the event of a prosecution no man is allowed to testify that a certain sample is oleo unless he be a chemist of undisputed ability, and then only after a careful analysis. 2d. That it is cheap (to the manufacturer). This, too, must be conceded, as will be seen by referring to the Robert Bell case:

85 pounds lard and tallow, @ 7c.....	\$5 95
10 " water	0 00
5 " dairy product, @ 25c.....	1 25
Total	\$7 20

When the 85 lbs. of tallow and lard are mixed with 5 lbs. dairy product, 10 lbs. water is taken up. This water, @ 20c., the market price of Oleo, will ship it to any market in the United States, if not in the world. The element of water alone would demoralize the dairy interest.

Turning to affairs in our own State, it becomes a matter of grave concern. A recent number of the State Journal, setting forth the industrial interests of Columbus, contained this announcement from the Capital City Dairy Co., and signed by its manager. "The output of the Capital City Dairy Company is 5,000 lbs. olio, daily, with demand for increased capacity." If a cow produces one pound of butter per day the year round, she is above the average. 5,000 lbs. Oleo then is displacing 5,000 cows. This number of cows will require for their subsistence, 20,000 acres of land. This farming land in Ohio, properly equipped with factories and implements, represents an investment of (\$1,500,000), one million five hundred thousand dollars. The Union Dairy Co., in Cleveland, is doing about the same thing, so that these two inexpensive olio shops, operated by a half dozen men, are killing an investment of three millions of dollars, requiring for its operation an army of men and women. The added expense of an olio extractor to a slaughtering establishment is not heavy, and it is believed that every dollar so invested in the United States will not much exceed the interest and taxes on the above agricultural investment for one year. But the two shops in Ohio are not all. Armour, and a few others, are sending a constant stream of the finished product to our State. From this view of the case, it is evident that the hopes of Armour and his friends are well founded. The contest, sir, is too unequal. It is more. It is *impossible*. It occasions no surprise to find, by statistics, that, in the decade of '76 to '86, the period when olio first made its assault, two hundred and twenty-nine thousand cows were driven from Ohio, nor that from '84 to '86, 1,377 cows disappeared from one county alone (Portage.)

In '84 and '85 milk sold for 5c per gallon, cheese 5c per pound, and butter for 10c per pound. Farmers everywhere were demoralized, and the dairy interests of the State were in full retreat. The laws, state and national, of '86, called a halt, and what promised to be a general stampede was checked.

The experience and observations of the past year, however, leads me to express the belief that if olio continues to be made in imitation of butter, the dairymen will be finally forced to yield, and, having left the field, they

will trespass upon every other branch of agriculture. Return will be impossible, as each attempt will be met with a prompt decline in prices. I am supported in this view of the result by the Report of the Internal Revenue Department, which says, as you will note: "That the manufacture of, and demand for olio is increasing. Natural butter will, of course, be made, but in quantities demanded by the wealthy and fastidious, and at prices far above the great army of consumers." Since, then, olio aims so high, threatening to destroy an industry second to none in the United States, and to supplant an article of food, whose healthful properties are assured by centuries of use, the question as to whether the intruder is of equal value and merit, becomes a pressing one. It is claimed by the friends of olio that it is cleaner than natural butter, that nothing but choice fats (leaf-lard, caul fat and kidney tallow) are employed in its manufacture. This claim is endorsed by the testimony of a few chemists of standing, prominent among whom is Prof. Atwater, of Connecticut. Prof. Atwater's testimony carried weight, his printed endorsement of olio circulating everywhere. He said he had witnessed the manufacture of olio, and that it was clean and wholesome. The claims were denied also. It was charged that trimmings, intestinal fat in filthy condition, deodorized fats from diseased and dead animals, all entered into the composition of olio. So far as Ohio was concerned nothing had been done, officially at least, to set the matter at rest. The statute creating this department instructs its chief to report to the Governor such statistics as he may deem of value, or interest. Believing that nothing could be of more interest to the citizens of Ohio than the character of the food they were eating, it was decided that a majority of this Board should visit representative olio establishments *unannounced*, and, if permitted, inspect the quality and condition of the fats used, and make an impartial report. In June last, therefore, Prof. H. A. Weber, Mr. Geghan and myself, visited the city of Chicago, with the above object in view.

The so-called "new industry" is not an Ohio industry. The base or 85 per cent. of neutral lard, and the tallow comes in casks from Chicago to Columbus and Cincinnati, and from Pittsburg to Cleveland. Oleomargarine is prohibited in Pennsylvania, but the oil is extracted, as will be seen by Mr. Talcott's report. Upon our arrival in Chicago we were shown through Moxie's establishment. He butchers no cattle or hogs, but collects his fats from the butcher-shops in the city, and from Armour. No fats were being received the day of our visit. The "cured" fats were on shelves, ranged about the mixing room. The temperature at which the fats were extracted, the proprietor told us, was from 80 to 120 deg. F. Men, with sleeves rolled up, mixed the fats with the 5 lbs. dairy products by hand. Our object was to see the beginning of oleo, and we soon went to

Armour's, where we found the plant in full operation. From 6 to 8 hogs are killed per minute. The intestines must be separated from the fats at the same rate, which requires an army of men. The odor and details of this intestinal room are too disgusting to find a place here. Enough, that if an intestine is ruptured, or torn completely off, there was no time to stop. We could not believe, after seeing this fat, that it went into oleo. We were not able to say, as we were not admitted to the oleo room, but invited to call upon some other occasion. We were shown the mixing room, which was less repulsive in manner of mixing than Moxie's. Our mission having failed, Mr. Talcott went to Pittsburg, and gained access to the coveted room. This report is herewith submitted without further remark than to say, that a copy has been sent to the proprietors months since, but has elicited no response.

JEFFERSON, OHIO, July 30, 1888.

Hon. F. A. DERTHICK, *Dairy & Food Commissioner, Columbus, Ohio:*

After visiting every department of W. & H. Walker's immense soap works and factory, last of all I was permitted to visit the inside works of the Pittsburg Melting Co., which my guide informed me, with a smile on his countenance, was an inside room of this vast concern. I was conducted into a large receiving room, where I saw a large quantity of the refuse fats of the slaughter houses and meat markets of the city unloaded direct from the gathering wagons. All the trimmings of fat off of the meat that will not sell readily to the retail trade is bought by Walker Brothers for this use. What little caul fat, leaf-lard and beef suet that can be bought my guide informed me they did use. He said the caul fat, the riddling of the intestines of the animals, yielded the most oil, and was the most profitable portion they could buy, but this quantity was so little they had to use all kinds they could get hold of to supply their trade. Of the stock I saw them at work upon at the time I can safely state that fully three-fourths of it was fat from beef, mutton and pork. He said the only condition necessary was to get it as fresh from the butcher as possible, and before it could get tainted and it would all make good oleo oil, but claimed it injured it if it got old and stale, and such pieces his workmen were assorting out of the pile, and throwing one side, which he said they manufactured into soap.

These men own the wagons that collect the refuse matter, and they keep them running constantly, and the fats are worked upon arrival at the factory. I suppose they are as cleanly about the handling of this food as they consider necessary, but in spite of good intentions it was covered with dirt and filth to such a high degree that my stomach would repel it for food. I saw caul fat put into the wash vat badly daubed and covered with manure, evidently the result of a fractured intestine, but the men never seemed to mind this, but put it all in the vat where it was thoroughly washed clean and nice in a liquid that I suppose was mainly water, but presume some purifying agent like sulphuric acid might have been added to help clean the fats. I did not question my guide upon this point, for fear that he would think I desired to learn too fast and stop the show.

The workmen here cut these fats all into small pieces while washing them in the vat, and then they were conveyed in an elevator to the next floor above.

We then went up stairs and I saw these small pieces of cleansed fat meat being emptied into a large hopper, and from the bottom of this they were conducted to a large cylinder meat cutter and passed through this and were cut up almost as fine as sausage meat; from this they were put into large iron kettles with agitators inside of them to

keep the fat in constant motion, when a steam heat of about 120 degrees was applied. My guide informed me 120 degrees was sufficient to produce the best results, and secure the oleo oil from the fat, and that in no instance did they ever let it go above 130 degrees. When sufficiently heated it was transported to hydraulic presses and the oleo oil first pressed out. The portions not fit for oleo oil were used for soap.

I was then conducted into the room where the finished product was stored and adulterated with the cheaper cotton seed oil in just such proportions as was necessary to produce the priced goods their customers demanded. I inquired if they had a fixed amount of the cotton seed oleo oil they always put into the product for butter, and he said no, but that if they put in too much of it the butter would be too soft, but for lard or cooking grease there was no limit.

He seemed very proud of his oleo oil and desired me to test it by taste. A very little bite of it was all that I needed for the test. He then informed me that the main product of their factory was sent to Holland for manufacture into oleomargarine, but that they did supply the Union Dairy Co., of Cleveland, Ohio, with quite a large quantity for their butter business in that city. This and its manufacture was the information I so much desired, and am very confident that the work as I then saw it is the actual standing of this business as conducted in the best appointed bogus butter factories of the land. The claim that nothing but the best and purest of fats are used, and that it is confined to beef suet and leaf-lard I believe is an absolute falsehood. No doubt but what all they do have of this material is used, but it then forms but a mere trifle of the fats that are used. Not a single particle of beef suet was used in my presence, but there were whole pieces of leaf-lard put into the cleaning vat with the other scrap fat, and all treated exactly as above stated. Our best medical advisers inform us that so low a degree of heat as 130 degrees will not kill any of the germs of animal life that may happen to be in the fat meat, and if such parasites as trychina should happen to be present they would most necessarily flow into the oleo oil, and no future process of the manufacture of this into oleomargarine would injure them in the least, but they would become a part of the butter and ready to put in their work when introduced into the human stomach. It seems to me an intelligent people should say stop.

From this investigation I am well satisfied our medical professors and scientific chemists have been badly duped into the belief that nothing but the purest of fats scrupulously cleanly in condition (at least they always so report) are used in the manufacture of oleo oil, and that when they investigate, the house is put in order and on dress parade, and the manufacturers are fully apprised of their coming, and ready to receive them. For certainly no better goods of this class are made upon the American continent than the product of the Pittsburg Melting Co.

Respectfully,

HENRY TALCOTT,

Ass't Dairy and Food Commissioner.

Upon receiving this report, it was resolved to make another effort to gain admission to Armour's room in Chicago. Dr. Detmers was commissioned to make the investigation. How well he succeeded the following report shows. It will be observed that this report is conservative. That whenever anything can be said in favor of Mr. Armour's plant it is said, but as to the quality and kind of fats there is but little difference in the Chicago and Pittsburg material. Dr. Detmers says "soiled," where Mr. Talcott uses the more expressive term, both referring to the contents of the intestine.

Hon. F. A. DERTHICK, Food and Dairy Commissioner of Ohio:

SIR: When, about the middle of last month, I incidentally talked to you of my intention to attend the meeting of the Veterinary Sanitary Convention on Nov. 19th, in Chicago, and was undecided whether to go or not, you urged me to go, and requested me to visit, when there, Phil. Armour & Co.'s, or any other large Oleomargarine and Butterine factory, to ascertain, if possible, by ocular inspection, the kind, quality, and condition of the fats used in the manufacture of the just-named substitutes for butter, and to report to you the result of my investigation. Your request I have complied with, and in the following I have the honor of presenting my report:

On the 19th of November, at about 10 a. m., I went to the packing establishment of Phil. Armour & Co., at the Union Stockyards, in the town of Lake, Cook county, Ill. But in order to have with me a good and reliable witness, able to confirm what I might see, if objections should be made to my report, I induced H. E. Hildebrand, M. D., 426 State street, Chicago, Ill., to go with me. When we arrived at the Armour packing establishment, we immediately called on Mr. Armour's partner, Mr. Michael Cudahy, who has charge of the whole business of the firm at the Union Stockyards. As I happen to be well acquainted with Mr. Cudahy, I at once informed him of the object of my presence, told him I had come as the representative of the Food and Dairy Commissioner of Ohio, and introduced Dr. Hildebrand as a friend of mine, who, although for many years a practicing physician in Chicago, who had never seen the Union Stockyards, and would like to see Armour's big establishment. I also stated that it was the principal object of my visit to see what kinds of fat are used in the manufacture of oleomargarine and butterine, and asked his permission to inspect the factory. This permission was readily granted, and a boy, an employe of the firm, was sent with us as our conductor. This boy was furnished with a written request to the foreman of the factory, in which it was stated that everything we might desire to see, was to be shown to us. As I read it myself, I know that it did not contain any secret instruction, besides that, we did not meet the foreman, but had every door opened to us by common employes. After we had stopped a few minutes where the hogs are killed, and where the fat is stripped from the intestines, we went directly to the building in which the oleomargarine and butterine are made. We passed through several rooms, first through those in which the product is finished, and advancing through the large building so as to see the butter substitutes in every stage, from the finished product down to the raw fats, we finally reached the rooms in which the raw materials, the animal fats, undergo the first process, and are thrown into big hoppers to be chopped, or cut up, by machinery. The further we went along the higher we found the temperature, which, as was stated to me upon inquiry, was about 100° F. in the room in which the raw fats are first taken into manipulation. Although the heat was rather oppressive to my companion and myself—the employes stated that it was almost unbearable in the summer—we stayed long enough to watch the proceedings, and to examine several truck-loads of raw fats. A good many of them arrived during our presence. On one side we found the beef fat (tallow) from the kidneys and from the intestines, and were informed upon inquiry that it served for the manufacture of oleomargarine; on the other side we found leaf-lard (kidney fat) and the fat from the intestines, (mesenterium and caul) of hogs. The leaf-lard of hogs and the kidney fat or tallow of cattle arrived in separate cars or trucks, and looked clean enough, but the fats stripped from the intestines of cattle, as well as of hogs, but particularly of the latter, looked rather soiled as if they had been handled with very dirty hands, and in the cars or trucks, which contained the same, we saw here and there small slices of meat, and parts of an intestine. One piece of intestine, apparently of the rectum, was at least two feet long. That the mesenterium contained the mesenteric glands, is self-evident. The fats of hogs, we were informed, are used for the manufacture of butterine; at any rate, we saw that they went into separate tanks, and were not mixed with the tallow of cattle. We found that about half the number of trucks we saw, contained kidney fat or leaf-lard of hogs, and kidney tallow of cattle respectively, while about half of them contained

fats stripped from the intestines, so that kidney fat and fat from the intestines, it seems, are used in about equal quantities or proportions in the manufacture of both oleomargarine and butterine. In every room, it is but justice to state, the most scrupulous cleanliness prevails, and although the temperature of the various rooms, but especially of those in which the raw fats undergo the first process, is very high, and said to be 100° F. in the latter—a statement, which, I do not doubt, is approximately correct—there was nowhere any offensive smell, neither were there any trimmings or refuse fats from butcher shops used, as far as we, Dr. Hildebrand and I, were able to learn and to see, although we took special pains in regard to that point. If there had been any such material, it would not have escaped our notice, and would have betrayed its presence by its unusually offensive smell, especially in such a high temperature and in such a moist atmosphere, rendered moist by the evaporations from the numerous vats, in which the fats are melted. On inquiry we were informed that the fats used reach the factory, as a rule, in about three hours after the animals, from which they come, have been killed. I asked this question not only of the employes—the laborers—but also of Mr. Cudaby himself. The latter informed me that all fats are sent to the factory as soon as cooled off, which, he stated, takes about three hours. The temperature in the vats, in which the chopped up fats are melted, is said to be in no instance less than 120° F., and under no circumstances more than 150° F. The workmen informed me that it is their endeavor to keep the temperature in the vats between 120° and 135° F. If it should rise to 155° F. or over, it would spoil the product, because then, the oleomargarine and the butterine, they stated, would become tainted with the animal smell. Whether any chemicals, besides common salt (chloride of sodium), of which considerable quantities are thrown into the vats, are used or not, we are not able to learn from our observations. There was, however, no smell of chlorine.

The above, I can assure you, is a perfectly impartial and unbiased statement, and every word said, I know, can be verified and be attested to by H. E. Hildebrand, M. D., who is a practicing physician at 426 State street, Chicago, Ill.

Very respectfully yours,

DR. H. J. DETMERS.

Professor of Veterinary Surgery, O. S. U.

COLUMBUS, OHIO, *December 1, 1888.*

These reports are by State officers of acknowledged standing, and must be taken as showing the inside workings of oleo factories when visited unannounced.

In the light of these reports, it became a matter of great interest to see Prof. Atwater, the famous Connecticut chemist, whose endorsement of the wholesomeness of oleo had been worth to Armour & Co., many thousands of dollars. By good fortune, a few days since, I had the pleasure of an interview with the above named gentleman in Prof. Weber's laboratory at the State University. Prof. Atwater was asked if he had visited oleo works upon different occasions. He replied, "Never but once, and then in the State of New York, and in company with a party of chemists and other gentlemen." He was then asked the vital question: "Were you expected the day of your visit?" He replied, "Yes." Comment is needless, further than to express surprise that Prof. Atwater should be willing to stand as sponsor for a yearly product of 69,000,000 pounds of oleo from plants that he never saw. Also the query whether or not the endorse-

ment given oleo by the few other chemists and medical men were not obtained under like circumstances? *i. e.*, when oleo was on "dress parade."

The question whether oleo is healthful is of even greater importance than whether it is clean. This commission is not equipped with means to investigate in this direction. Indeed, it may require years of actual use to determine. Public health is injured or improved by slow processes. While testimony on either side is wanting in Ohio, in New York and other states it is very abundant. The law provides that this report shall be incorporated in the report of the agricultural department, a volume already too cumbersome for convenience. This provision compels brevity. The second annual report of the New York dairy commission, in a book of nearly 500 pages, gives the history of exhaustive researches and investigation made in that State. More than \$300,000 have been appropriated within five years to enable the commission to investigate the healthfulness of oleo, to enforce the dairy laws, and develop the dairy interests of New York. While it may be, and is, charged by some, that the subject is not settled, it is very significant that the law-making power of that State, after costly and continued inquiry by committees from the House and Senate, in a bill entitled, "A bill to prevent deception in the sale of dairy products and to preserve the public health," has absolutely prohibited the manufacture and sale of oleo, in imitation of natural butter. So severely is the law construed that at the recent food exhibit held in Albany, it was held, by the courts, that a display should not be made of oleo, as it was in violation of law to have it in possession.

Dr. R. D. Clark, of Albany, a physician of good standing, as well as chemist to the dairy commission of New York, after elaborate experiments and investigations, reports against the use of artificial butters upon the following grounds :

First. On account of their indigestibility.

Second. On account of their insolubility when made from animal fats.

Third. On account of their liability to carry germs of disease into the human system.

Fourth. On account of the probability of their containing, when made under certain patents, or in a careless manner, unhealthy ingredients.

Dr. Clark says that it is a matter of common observation among physicians that natural butter is taken by invalids, especially consumptives, when other fats, even cod-liver oil, cannot be tolerated.

It is shown by experiments made by the same gentleman that oleo will not liquefy at anything near the temperature of the stomach. He placed in an oven kept at a temperature of from 100 to 104 degs. F., four beakers, containing respectively pure butter, oleomargarine, oleo oil and lard oil, about 20 drachms of each, and which were all at the temperature

of about 60 degs. F. when taken. At the expiration of thirty-five minutes and the temperature at 100 degs. F., the butter presented a clear, limpid appearance, but the others remained solid, being but very little affected, and at the end of five hours, the temperature being from 100 to 104 F., they were in a semi-solid condition. The doctor says: "These insoluble fats then must interfere with digestion in two (2) ways. First, by not being acted upon themselves by the gastric juice, and second, by being thoroughly mixed with the other foods in the mouth they form an impervious covering to them, thereby preventing the gastric juice from coming in direct contact with them."

Experiments were made upon the artificial digestions with exactly the results to be expected from the preceding test.

Natural butter is acted upon immediately, and at the end of one hour is in a more advanced state of emulsion than the olio is at the end of four hours. At the end of twelve hours it was shown that the oleo was in no better condition to be assimilated and used by the system than the butter was at the end of four hours.

From the above facts it is a question whether oleo, refusing to melt at the temperature of the stomach, or to be acted upon by its juices for so many hours, is not finally rejected by the system and the object for which it was taken lost.

The N. Y. Commissioner's report teems with testimony based upon experiments, showing beyond a reasonable doubt that oleo is undesirable.

In his letter before the Humboldt-Verein, a report of which appeared in the Ohio State Journal December 5, 1887, Prof. H. A. Weber, State Chemist, said: "Trichinæ develops in the stomach of domestic animals, passing into the intestines, where it multiplies. There they bore through the intestinal walls and encyst themselves in the muscles. In its journey the parasite must pass through the fat tissues of the animal, and while in this state would easily find a birth in artificial butter or oleomargarine. The fats are rendered at a very low temperature, such as would not suffice to kill trichinæ or disease germs. The chief danger from artificial butter lies in its indigestibility. Only persons of the strongest physical make-up can use it without serious effect. To infants and sick people it is almost sure to be fatal."

While it may be that the above opinions are not unanimous, it is doubtful if any chemist or physician of repute will assert that nearly raw tallow and lard is as safe or digestible as pure butter.

Finally, in view of the blighting influence of oleomargarine upon the prosperity of all our people, and because of the filthy material that forms so large a part of its composition and the apprehensions concerning its

deleterious effects upon the public health, I am impelled to recommend to you, and through you to the General Assembly, that its manufacture and sale in imitation of natural butter be prohibited in Ohio. The testimony of Prof. Weber given above, and the reports of the Assistant Commissioners will apprise you of the fact that this board is a unit in regard to the above recommendation.

It is insisted that such a law will be in the interests of any or all who, from desire or circumstances have occasion for its use as oleo, will then come upon the market in a distinct form with its intrinsic value unimpaired, and purchasable at a price more nearly just. If this should be done, then oleo and pure butter may be said to be in competition—a condition and experience entirely new.

The people of the State are, in the main, interested in our work, and supporting our efforts. Personally, I have visited every considerable city in the State, and have brought actions in Columbus, Springfield, Toledo and Cleveland, followed in most instances by prompt conviction. No arrests have been made, unless a willful purpose to violate the law was suspected or known. The fight for pure food is "on," and great interest is centred in the national pure food bill now pending in Congress. Citizens realize that adulterations of foods and medicines is not only "a fraud that robs, but a crime that kills." Your attention is respectfully called to the fact that the N. Y. Commission is equipped with an appropriation for the present year of \$90,000 (ninety thousand) to supervise the dairy interests of the State, while this board is responsible for the whole field of food and drink on an appropriation of \$6,300 (six thousand three hundred). The examination of food will be pushed as rapidly as our means admit. The enforcement of the laws governing the foods on the market is in the interests of the whole people, and their hearty support is earnestly invited.

The accompanying reports of the Assistant Commissioners commend themselves as showing effective work, and loyal support to the new administration.

To Prof. H. A. Weber, State Chemist, I am deeply indebted for his intelligent and ready assistance during the entire year. His report herewith will be studied with great interest.

The whole expense of this Department for the year ending November 15, 1888, is :

Salary of Commissioner Derthick.....	\$1,500 00
Expenses "	457 36
Salary Assistant Commissioner Geghan.....	1,000 00
Expenses " {	600 00

Salary Assistant Commissioner Talcott.....	\$1,000 00
Expenses "	569 09
Compensation Chemists Weber and Dickorie.....	715 00
Total	\$5,841 45

Respectfully submitted.

F. A. DERTHICK,
Ohio Dairy and Food Commissioner.

REPORT OF THE ASSISTANT DAIRY AND FOOD COMMISSIONER FOR THE THIRD DISTRICT FOR THE YEAR 1888.

JEFFERSON, OHIO, November 15, 1888.

To the Hon. F. A. DERTHICK, Dairy and Food Commissioner, Columbus, Ohio :

I have the honor of submitting herewith my annual report to you, in compliance with the law for my work as Assistant Dairy and Food Commissioner of the Third District of Ohio, ending with November 15, 1888.

At commencement of this last year's work by me it was your Honor's first acceptance of the Commissioner's chair. We were laboring under embarrassment in the enforcement of our oleomargarine law in consequence of an amendment made to the original act, and passed March 21, 1887, whereby the law was considered to have been made unconstitutional by reason of these late amendments. Eminent jurists gave this as their opinion in private. In view of this supposed defect, I had studiously avoided the Cuyahoga county courts from April 1, 1887, to November 1, 1887, bringing only such cases there for trial as I felt assured would not involve the constitutionality of the law, and wherein the defendants would plead guilty. I purposely omitted the use of the objectionable portion of the law in my affidavits for arrest, and not having them appear in the information. The constitutionality of the law was not called in question until November 21, 1887.

November 3, 1887, I caused the arrest of H. B. West for violating the oleomargarine law by using it upon the dining-room tables of the new Johnson House in the city of Cleveland, contrary to the law. He did not post up the required placard or sign in a conspicuous place, informing his guests of the fact that he was using oleomargarine instead of genuine butter upon his tables. Before arresting him for this crime I went to his office in person, and charged him with then having and using oleomargarine upon his tables in violation of the dairy law; and informed him that Mr. A. P. Reynolds had just eaten his dinner at his tables, and found them all supplied with bogus butter. Mr. West instantly pleaded guilty to the charge, but in justification of his crime said he did not make a practice of using it all the time. It was only occasionally when he could not procure good butter for the table use. He said, however, at the time, that he was caught fairly, and would settle the bill immediately, and wanted to know at once what the damage would be. I informed him that I had no power to settle for the offence, but if he would appear in the police court the next morning at nine o'clock A. M., and plead guilty to the charge, I had no doubt but what Judge Kelley would let him off with the minimum fine of fifty dollars and the little trifling cost for record of the case. This he agreed to do, and said that he desired that no great publicity of the matter be made, because if it was done it would injure the business of his house. With this understanding I left the matter for his appearance in court November 4, 1887, at nine A. M., but having so good a case I felt unwilling to take any chances of losing it, therefore I had my witness, Mr. A. P. Reynolds, take a sample of the oleomargarine he found on the tables of the New Johnson

House, at noon, November 3, and deliver it to Dr. G. C. Ashman, our legal chemist for the third district, and have it analyzed to prove the fact of its being oleomargarine beyond any question, should Mr. H. B. West come in court the next day and change his mind, and conclude to stand trial to test the constitutionality of the law, and, if possible, to escape punishment for the offence.

November 4, Mr. West appeared with his attorney, Ex-Judge John C. Hutchins, and pleaded "not guilty," and gave the court notice that he should defend the case upon the constitutionality of the law, and asked that its hearing be postponed to November 21, in order to give him time to prepare the case. The case was set for hearing at the above-named time. The police court prosecutor, who is the only officer contemplated by law to take the charge of all such cases for the State, manifested such a reluctance to do the work, I felt that the interests of the State would be sacrificed in his hands. There was no other way to do but to employ able counsel, fully the equal of Judge Hutchins to try the case. I then secured the services of Ex-Judge G. B. Solders, of Cleveland, to take the charge of our case. I agreed to pay him for his work out of the small amount of expense money allowed me every month to prosecute this work.

The 21st of November came and we were ready for trial. Judge Hutchins then offered a demurrer to our information asking that it be made to include the whole of section 7, whereby he would have an opportunity to contest the law. The Police Judge sustained his demurrer, and we were compelled to change our information to charge him with not keeping up a placard sign "to the satisfaction of the Dairy and Food Commissioner or Assistant Commissioner"—the satisfaction clause being the objectionable feature of the law.

With this amendment, the case was again put over to a future day, and at the request of the defendant, was several times more put off, while we were to the expense of needless preparations and the annoyance of such great delay. The 29th of December, however, it was at last reached, and the case was tried before the court. Our evidence was as positive and direct as could possibly be made. There was no doubt in the matter. The defence offered no testimony, and Judge Kelly rendered a decision of guilty, and imposed a fine of fifty dollars and cost upon Mr. West. Judge Hutchins argued only upon the constitutionality of the law admitting guilt of prisoner, but the court thought that higher courts than his should be the ones to pass upon the constitutionality of the law, and suggested a reference of the case to them. A notice of appeal was given, and at the February term of Judge Hamilton's court the case came up for hearing.

The county prosecuting attorney had agreed, if any cases from the lower courts were carried up into his courts for trial, to take charge of them for the State according to the provisions of the law. The expense funds at my disposal were all exhausted in the trial of this case. The police court and the whole indebtedness could not be paid except by call upon your Honor for twenty-five dollars to close the matter up with Judge Solders.

For lack of funds, we had to dismiss Judge Solders from further services in the case. In consequence of this unfortunate circumstance, Judge Hutchins carried up the case into Common Pleas Court with such a ridiculous report of the testimony given in the Police Court, and made out wholly by himself, that Judge Hamilton decided he should set the case aside for insufficient evidence to convict in the Police Court, and not decide upon the constitutionality of the law. He left it optional with the Commissioners whether he should remand the case back to the Police Court for second trial to perfect the evidence and fairly convict the accused, or whether he should be cleared at once. By permission, I asked the court "if we should go back to the lower court and convict a second time, and his decision then should rest upon the constitutionality of the law, whether it should then sustain the law?" The Court frankly admitted that with his present information, he considered the law so objectionable, that it had better be amended at once. I then informed the Court that such being the decision, I had no desire to prosecute the case farther in the lower courts. He then made a final close of the case. Our Commissioners then urged the General Assembly to amend the objectionable clause.

which was done on March 8, 1888, and it is now believed to be a constitutional law, and thus far has not again been questioned in the courts.

From commencement of the Commission up to the present hour, the dairy law of Ohio is not regarded with very high favor in the Cuyahoga county courts, nor are the officers very anxious to have our cases come before them. The public sentiment, I am sorry to say, is greatly in favor of the frauds, because, as I am often told, it lessens the price of genuine goods, and helps to sustain possible industries in the city that swell its business prosperity, if not its morals. With hindrances of this nature, coupled with the ridiculously small amount of money appropriated for the expenses of the prosecution of this work, much crime goes unpunished.

It is necessary to have good responsible witnesses in every contested case. It is also necessary to have an attorney of fair average ability to conduct our cases in court when a contest comes. Such men will not work without pay, and there is no provision made in this Commission or the dairy and food law for the payment of such expenses. Cuyahoga county seems to be an exception to all others in my district, and the county prosecuting attorney, who is made the legal officer to attend to these cases, says he has no jurisdiction over them or any criminal offenses committed within four miles of the court house, until the cases come up to the higher courts from the police or justices' courts on appeal or indictment. Therefore our Commission must procure our own counsel in Cuyahoga county, or else let the whole dairy and food law go by default. No other State of the Union attempts this work in such a feeble manner. New York State appropriates and uses ninety thousand dollars to enforce these laws, and also employs sufficient help as witnesses, milk inspectors, attorneys, to do vigorous and thorough work. Ohio expends less than six thousand dollars in her efforts to accomplish the same task. It is so manifestly necessary, that the power of the Commission be increased by extra force of help and money, that I hope the wisdom of our next General Assembly will equal the emergency and grant a reasonable increase.

As soon as I could learn of the amended oleomargarine law last spring and procure a copy of it, I visited the dealers in Mahoning county and inspected their stores. I found four dealers who were selling oleomargarine contrary to law, without having up the proper placard sign to inform their customers, or using labels on packages of it when sold; so far as I could learn. At all events, they were not properly provided with them upon my visitation, although they had and were selling oleomargarine every day. I caused the arrest of Patrick Murphy, Williams & Lamb, Henry Onions & Co., W. B. James & Son. A day was set for trial. The prosecuting attorney found before trial was to come that a strong sympathy was existing in Youngstown in favor of these defendants, and that the deputy internal revenue officer, together with the wholesale dealer of oleomargarine in that city, would come in court and swear that the proper signs had been up in all these stores, but their not being found by me was purely from accidental dropping down of the signs. Also, the dealers and all their clerks would swear to the same. The prosecutor gave it as his opinion we could not convict them in court of any willful intent to violate the law, and he believed the juries would let them all go free. But he said they all promised to give up the trade, and the wholesale dealer agreed not to take out another license. In view of this reform, and all things considered, he went so slow with our cases they were never called in court. I also visited the stores of every licensed dealer in my district outside of Cleveland in the month of April, 1888, but could not make a case against any of them.

The first of May being the commencement of another year, and the time dealers in oleomargarine are required to take out license under the national law, I then commenced a visitation of the stores in my district to see if the dealers were selling oleomargarine without license or in violation of our dairy law. I engaged Mr. A. P. Reynolds, a very prominent butter broker in Cleveland, to help in this work in that city, so we could accomplish it more expeditiously. Outside of Cleveland we could not find any violators of the law; but on the west side, in Cleveland, we found a dealer selling oleomargarine

for butter. I caused the arrest to be made promptly, and a plea of "guilty," before Justice Peck, was made, and a fine of fifty dollars, and the costs, was paid, and the case thus disposed of. I also found, a few days later, that Mrs. Eliza Wren, keeper of the Newburgh House, on Broadway, was using oleomargarine on her tables contrary to law. I had her arrested and she appeared in Justice Peck's court, pleaded "guilty," and paid a fine of fifty dollars and costs. June 10th I caused the arrest of Mrs. F. Scheurer, No. 124 Erie street, proprietress of a large boarding house, for the same offense. She also appeared in Justice Peck's court, pleaded "guilty," and paid a fine of fifty dollars and costs. In July Mr. A. P. Reynolds found Mr. M. J. Kellackay, a grocery dealer in Payne avenue, selling oleomargarine in violation of both State and national law. In company with the deputy internal revenue officer, Mr. Reynolds went the second time to Mr. Kellackay's store, where the revenue officer seized their stock of oleomargarine and conveyed it to his office, and Mr. Kellackay settled with him for the offense by taking out a yearly license at a cost of forty-eight dollars. I ordered the arrest of M. J. Kellackay in Justice Peck's court to answer for violation of the State law in the above case, and at day of trial he appeared and called for a jury. A continuance of the case was made, and a venire issued according to our new justice law, giving jurisdiction in food cases, which act was passed April 3, 1888, Ohio Laws, volume 85, page 144. The attorney for the defense made a demurrer and asked the court to quash the proceedings against the defendant, on account of the imperfections of the law giving jurisdiction of such cases over to the justice courts. It took the court by surprise, and the counsel employed by the State failed to fairly meet the arguments of defendant's counsel, and Justice Peck decided the case against the State and let the prisoner free, without any hearing of the testimony in the case. Not being satisfied with this defeat, I counseled with your Honor and we concluded best to re-arrest Mr. M. J. Kellackay in Justice Bauder's court. Our attorneys spent considerable time in preparation of the case, and also in posting himself, and a few days ago the second trial came off of this case. The same defense was offered as upon former trial, but Justice Bauder held that the law was constitutional, and the defense must proceed with the case. A jury of twelve men were impanelled from the sixteen called by the venire, and the trial commenced. It was fairly conducted, and the evidence showed plainly the crime had been committed, but the defendant swore upon the stand he supposed it was genuine butter he was selling, and did not know it was oleomargarine; he swore he called for dairy butter when he purchased, and the jury received his evidence with compassion for him, and after several ballots brought him in "not guilty," requiring the State to prove absolutely the intent of a person to commit a crime. Of course, under such a ruling, it is difficult to punish crime of this nature. The public sentiment seems to be in favor of these industries in the city of Cleveland, and as neither the press nor the courts condemn it freely, our Commission is at a disadvantage in every step of the work. But, as I have before stated, we are not confronted with any of these difficulties in counties other than Cuyahoga. The city board of health in Cleveland having added a milk inspector to their force of help, we have united with them in punishment of a few dealers for selling adulterated milk, and have fined several of them fifty dollars and costs under the dairy law, which is a more severe punishment to offenders than is usually meted out to criminals punished by the city board of health. We hope, with this effective aid, to accomplish greater good in correcting the sale of impure milk.

I have made several attempts this summer to work up cases against milk dealers in different parts of my district for selling watered milk for genuine; but I cannot get the milk transported to our chemists soon enough before decomposition takes place to get an analysis of it that is perfect enough for evidence in court. Therefore, I fail to make any cases sufficiently strong to warrant a prosecution. I can see no way to procure evidence except to hire witnesses to watch suspected parties and catch them in the act of tampering with their milk. The expense money allotted to me each month is not sufficient to meet such cases, therefore I must let most of them pass.

I had my attention called a few weeks ago to the case of a Mr. W. H. Haggerty, of Pierpont, Ohio, who was reported to me as furnishing watered milk every day to the

Pierpont cheese factory, to be made into cheese, when the rules of the factory required whole milk to be furnished. I advised the cheese factory managers to hire two witnesses, at least, to watch this man in handling his milk, and catch him, if possible, in the act. This was done, and Thursday night, October 25, he was seen by two witnesses to put a large pail of water from his well into the milk-can, and then immediately proceeded to milk his cows and pour his fresh new milk into the can with the water; and when delivered to the factory next morning it was then examined by the lactometer test and found to be the same in quality he was furnishing every day. It showed conclusively that his practice had been uniformly to water his milk. A committee went Friday, when he was milking, and took a sample from his pail, and this milk would then test pure milk, the same as all his neighbors.

For this offense I caused him to be indicted before our grand jury, on Monday, October 29, and his trial is set for the latter part of our present term of court.

In order to make the punishment for the violation of the dairy law successful, so far as the adulteration of milk is concerned, I would advise the thorough practical laws and efforts pursued by the New York State Dairy Commission, as published very completely in their late report of May 4, 1888, fourth volume.

Many other States are fairly furnished with means to punish this class of frauds, but none of them can do it so thoroughly as New York. There is no doubt but what the milk consumers of the State are benefited far more than the cost of the entire Commission, by the enforcement of their dairy law in such a vigorous manner.

Last July, having been repeatedly informed by the superintendent of the Union Dairy Co., of Cleveland, the largest manufacturer of oleomargarine in Ohio, that they purchased their supply of oleo oil of the Pittsburg Melting Co., and believing that this chief factory of bogus butter, forming fully 85 per cent. of the finished product, was not such food as a civilized people should be made to eat, I begged your permission to go to Pittsburg and investigate the manufacture of oleo oil as made by the Pittsburg Melting Co. I hereby submit my report of that investigation. [Incorporated in Commissioner's report.]

It seems to me that with all the evidence before our American people of the indecent preparation of this article of food, together with its very questionable sanitary qualities, as an act of humanity towards our children and those dependent upon us, we should ask and even demand of our law-makers a prohibitory law, perfect enough to effectually suppress its manufacture and sale.

It should be National, but is better to be by State enactment and enforcement than not at all. I hope our present General Assembly will not close its winter session until it does pass a law prohibiting the manufacture and sale of oleomargarine in Ohio.

Early last season our Commission attempted a reform in the sale of impure vinegar in Ohio, and to substitute for the unhealthy acid or drug vinegar a pure and healthful article of cider vinegar.

Upon visiting the dealers in my district outside of Cleveland, all of them seemed willing and anxious to obey the law. Our law of last year was so defective we did not bring prosecutions under it, but in its present state as amended by our General Assembly April 14, 1888, I find every intelligent and reasonable person pronounces it good, and all the dealers, except a few in Cleveland, are obeying the law in letter and spirit. We have spent many weeks of visitation to the dealers in all the principal cities of our district and very carefully supplied them with copies of the law. The city and country press have aided us in the thorough dissemination of this law, and I am pleased to observe its very general acceptancy by our dealers. I have just secured, by competent witness, samples of vinegar from some of the wholesale dealers in Cleveland, and have placed them all in the hands of our chemist, and should they prove to be frauds and in violation of the law, after having given such fair warning and so much information, I see no other course left for our Commission but to try to enforce the law by prosecution in the Cuyahoga county court, which is soon to be our most earnest work.

The Union Dairy Co., I believe, is the only company in Ohio now manufacturing oleomargarine. Mr. A. R. Duncan, of Cleveland, is the only wholesale dealer in their goods in my part of Ohio, that I can find. Mr. Phil. Armour has taken out a wholesale license for his Akron house, and Mr. James Gibbons, of Cleveland, has also taken out a wholesale dealer's license for the sale of Armour's oleomargarine. These are all the wholesale dealers thus far for 1888, registered on the internal revenue books in my district. There are, also, in addition to these three wholesale dealers, seventy-two retail dealers in my district, but mostly confined to Cuyahoga county and in the city of Cleveland. Our Commission regret to report the fact that many other articles of adulterated food are being tolerated simply because we have not sufficient help to work up cases, or money to prosecute the offenders if we could make the cases. I have watched the cheese factory shipments of cheese very carefully, and have not been able during the past year to find any cheese illegally branded.

If our present law was so amended that the Dairy Commission could issue a legal blank for factory use the same as the New York State law authorizes, I believe it would not only elevate the standard of excellence in Ohio cheese, but would help its reputation and sale.

Last July I collected samples of high-colored candies for analysis, to help you determine the sanitary condition and quality of these goods. Also, later I visited the glucose factories of Buffalo and procured samples of their goods for the same purpose, all of which I have duly reported to you before. I am happy to say the very general observance of the maple syrup law of 1886, by the farmers, has made it almost impossible for adulterated maple goods to be sold in Ohio. Consumers have learned to buy only the original cans as put up by the farmers and with the name of each manufacturer on them. It therefore offers a splendid opportunity for farmers to build up a regular demand for their syrup by putting nothing upon the market except a prime article, full weight and measure.

The expenses of my office and official work for the past year, as per vouchers before submitted, is as follows :

For the month of November, 1887.....	\$78 15
" December, "	57 15
" January, 1888.....	56 05
" February, "	30 15
" March, "	39 85
" April, "	28 90
" May, "	53 20
" June, "	45 49
" July, "	60 35
" August, "	62 55
" September, "	30 44
" October, "	26 80
Salary for the year	1,000 00
Total	\$1,569 09
Most respectfully submitted.	

HENRY TALCOTT.

Hon. F. A. DERTHICK, Ohio State Dairy and Food Commissioner, Columbus, Ohio :

DEAR SIR: I have the honor to submit to you the following condensed report of my work as Assistant Commissioner for the year ending October 31, 1888 :

Owing to the law enacted by the Legislature prohibiting the manufacture and sale of artificially colored vinegar in this State, fully two-thirds of my time has been em-

ployed in enforcing this law. During the first part of the year very few of the wholesale and retail grocers in this district had in stock "fruit or cider vinegar." Their stock consisted mainly of artificially colored vinegar. This artificially colored vinegar I compelled the grocers to reship to the parties whom they purchased it from. During the year ending October 31, 1888, no less than 1,500 barrels, or 67,500 gallons of artificially colored vinegar has been driven out of the market. When this artificially colored vinegar was the product of factories located in this State, purchasers experienced no difficulty in having it taken off their hands, but when the vinegar was the product of manufacturers residing outside of the State of Ohio the case was different. Those foreign manufacturers could not be reached in person for violating Ohio laws. The only remedy to be had was the enforcement of the spoliation clause of the law, which gives the Commissioner power to destroy all vinegar that is not in accordance with the law. During the month of August, Fay, Hirsch & Co., vinegar manufacturers of Louisville, Ky., sold to the retail grocers of Cincinnati about 500 barrels of vinegar. This vinegar was branded "Evaporated Fruit Vinegar," and was sold for pure cider vinegar. If there was any fruit used in the manufacture of this vinegar it must surely have evaporated or disappeared, for when it was analyzed there was but very little traces of the extract of fruit found in the substance. This vinegar was sold to the retail grocers for sixteen cents per gallon, an extraordinary high price, even for pure cider vinegar. I had no less than eight samples of this vinegar analyzed by four chemists, and each of them pronounced the vinegar not cider vinegar, but adulterated stuff. I immediately seized a lot of this stuff and dumped it into the gutter. Fay, Hirsch & Co. removed the balance of the stuff out of the State.

MAPLE SYRUP.

Considerable attention has been paid to the enforcement of the law providing that all packages containing maple syrup must be properly branded, and the name and residence of the manufacturer placed thereon. During the month of April, in accordance with information I received from you, and on your arrival at Cincinnati, we proceeded to the residence of J. R. Lindsey, on Bremen street, and found him manufacturing a syrup from cane sugar, which he was selling to the trade in Cincinnati for pure maple syrup. The packages containing this syrup were branded "Pure Maple Syrup," though when analyzed it was found to contain, not a particle of maple sugar, but flavored to imitate maple syrup. I had a warrant issued for the arrest of Lindsey, on which he was arrested, and fined five hundred dollars and costs, in the Police Court of Cincinnati. This punishment of Lindsey was the means of breaking up his nefarious business, and deterring others from participating in like frauds upon the public.

Three-fourths of all the adulterated maple syrup which I find in the market comes from the city of Chicago, Illinois. Considering the large amount of adulterated food that I find in the market, and coming from Chicago, it would seem as though the manufacturers of articles of food in that city were wholly engaged in manufacturing nothing but adulterated food. All maple syrups coming from Chicago contain from twenty-five (25) to fifty (50) per cent. of glucose. If the Dairy and Food Commission was allowed by statute law to destroy maple syrup that is found adulterated, the same as adulterated vinegar, it would not take long to drive the adulterated stuff out of the market.

OLEOMARGARINE.

The following persons deal in oleomargarine in the twenty-nine counties comprising this district :

Asroth, F. H.....	Cincinnati, Ohio.	McGrevey, P.....	Cincinnati, Ohio.
Aylward, J.....	"	Miller & Co., A. J.....	"
Berens, H. J.....	"	Multner, Wm.....	"
Brandewine, L. H.....	"	Mack, Mary.....	"
Bush, H.....	"	Mescher, F.....	"
Behrens, F. H.....	"	Meara, Tom.....	"
Cronin, D. J.....	"	Mulvihill, J. C.....	"
Collins, Patrick.....	"	McCombs, W. G.....	"
Cain, A. W.....	"	McCormack, J.....	"
Duncan, E.....	"	Menning, F.....	"
Dunhoff, A. F.....	"	Moser, J. F.....	"
Denneman, F.....	"	Neimes & Fuchs.....	"
Everett, E. W.....	"	Nolan, M.....	"
Fallon, J.....	"	Nugent, G. F.....	"
Foster, Thomas.....	"	Neiboff, J. G.....	"
Farrell, Ellen.....	"	Neivers, —.....	"
Grote, F.....	"	O'Hara, J. E.....	"
Gehman, S.....	"	Pryor, P.....	"
Grear, W. H.....	"	Rolfing & Baske.....	"
Grear, R. D.....	"	Reidy, Andy.....	"
Gordon, C.....	"	Ryon & Sons.....	"
Gaibe, H.....	"	Rohan, Andy.....	"
Geling, J.....	"	Reinhold, L. G.....	"
Gecking, John.....	"	Stephens, W. H.....	"
Haas & Diehl.....	"	Sweeney, Mrs. B.....	"
Hamilton, William.....	"	Secking, H.....	"
Hamilton, William.....	"	Snell, W. B.....	"
Hamillon, William.....	"	Standish, W. C.....	"
Hamilton, William.....	"	Sommers, J. F.....	"
Hope, J. J.....	"	Seiter, J. F.....	"
Hope, M.....	"	Seiter, J. F.....	"
Hohnes, F.....	"	Seiter, J. F.....	"
Hannon, D.....	"	Tracey, P.....	"
Haaff, M.....	"	Tuchfaber, S.....	"
Haartanert, F. W.....	"	Thimmes, H.....	"
Haartanert, F. W.....	"	Teinerman, W. J.....	"
Haartanert, F. W.....	"	Victor, Edward.....	"
Hart, B.....	"	Victor, Edward.....	"
Hilbers, H. B.....	"	Wallenborg, B.....	"
Hart, J. A.....	"	Woodburn, R.....	"
Johanningham, G.....	"	Wilfers, —.....	"
Johanningham, G.....	"	Wardner, J. F.....	"
Johanningham, H.....	"	Holtgrieve & Feilbach.....	Toledo, Ohio.
Johanningham, J.....	"	Finch, G. W.....	"
Jones, A. E.....	"	Nesbitt, Andrew.....	"
Justin Bros. & Co.....	"	Campbell, James.....	"
Kelley, J. J.....	"	Miller Bros.....	"
Lehman, D.....	"	Monmee, Isidore.....	"
Laughlin, W. B.....	"	Barnes, Henry.....	"
Lobeck, J. R.....	"	Talmadge, C.....	"
Linnenbrink, —.....	"	Aubery, Joseph.....	East "
Miller, Geo.....	"	Metzger Bros.....	Findlay, Ohio.
Mockler, Michael.....	"		

*Wholesale Dealers in Oleomargarine.**

Jelke, F., & Son.....	Cincinnati, Ohio.	Lahman, F. H.....	Cincinnati, Ohio.
Haile, J. R., & Co.....	"	Allan, H. M.....	"
Stevens, S. J.....	"		

According to the foregoing location of dealers in oleomargarine, you will readily see that it is only sold in the large cities of Cincinnati and Toledo. Out of the twenty-nine counties constituting this district, oleomargarine is only sold in three of them, viz, Hamilton, Lucas and Hancock counties. When the Ohio Dairy and Food Commission

was organized in May, 1886, oleomargarine was sold in every county in this district, and sold for pure creamery butter at that. At the date referred to and previous, oleomargarine was used entirely in the Soldiers' Home, at Dayton, Ohio, and without the knowledge of the officials, who imagined they were purchasing pure creamery butter, but since the expose was made through the Commission, two and a half years ago, not a pound of oleomargarine has been used at the National Home of Dayton, Ohio. I venture to say that if the Legislature of Ohio had not passed the oleomargarine law, regulating its sale and to prohibit fraud, the dairy interests of this State, as relates to the manufacture of creamery butter, would have almost been done away with by this time. The law has been rigidly enforced, and the dealers in oleomargarine have been more careful in complying with its provisions during the last year, than they had during the previous year, consequently there has not been so many arrests for violation of the law this year as there had been the year previous—or the year subsequent, to the law going into effect. Owing to the uniform and reasonable price of dairy and creamery butter to within the last month, I thought it would be a good thing to prohibit the sale and use of oleomargarine in this State. For some unexplained cause creamery butter has been advanced during the last month from twenty-eight to thirty-five and forty cents a pound by the manufacturers. I can see no reasonable cause for this unreasonable advance in this article of food, unless the manufacturers of creamery butter have entered into a Trust for the purpose of fleecing the public. If the agricultural districts had been visited by drouth or an epidemic amongst dairy cattle, which would curtail the supply of dairy products, there would be some excuse for the recent and uncalled for rapid advance of creamery butter, but no such causes have existed, on the contrary the past season has been more than favorable toward a plentiful supply all over the country of dairy products.

Science so far has failed to pronounce against oleomargarine as an unhealthy article of food, but ocular demonstration has proved to my satisfaction that the ingredients entering into its composition are not as clean as they ought to be for an article used for human food.

The following is the number of stores, hotels, etc., that I have visited during the year:

Number of grocery stores, hotels, restaurants and boarding houses inspected :

Date.	Groceries.	Hotels.	Restaurants.	Public.	Boarding.	Oleomargarine Factory.	Vinegar Factory.
November, 1887	210	27	54	.....	70	.....	3
December, "	450	22	40	7	60	.....	.....
January, 1888	370	16	34	.....	41	.....	5
February, "	276	17	49	.....	52	.....	.....
March, "	310	14	61	.....	79	.....	.....
April, "	280	11	56	.....	64	.....	.....
May, "	290	9	41	2	30	.....	3
June, "	410	7	30	1	45	3	.....
July, "	322	5	21	.....	15	.....	.....
August, "	201	4	16	.....	19	.....	3
September, "	270	11	24	.....	27	.....	5
October, "	317	19	42	.....	20	.....	4
Total	3,700	162	468	10	517	3	23

As there is no oleomargarine factory in this district, I visited Chicago in company with yourself and Prof. Henry A. Weber, Agricultural Chemist to the Ohio State Uni-

versity, for the purpose of examining the process of producing the oleo-fat and the neutral lard, that oleomargarine is made from. While the proprietors of those places where the substances I have mentioned are made, did not fully show to us all we wished to see, yet, I saw enough to satisfy me that the articles that oleomargarine is produced from are uncleanly made, and are often mixed in their primitive state with offals of the animals that they are taken from.

In conclusion I would beg leave to suggest, that the present vinegar law ought to be amended so that each package containing vinegar should be inspected, both as to quality and kind, and the same placed in stencil marks on each package. Cider or fruit vinegar should at least acquire a strength equal to thirty-five grains, before being permitted to be sold as vinegar. And so-called malt or distilled vinegar should be at least forty grains in strength.

The members of the Commission should have the right to seize and destroy all adulterated articles of food, that is not in conformity with the laws of Ohio. If this power was granted or vested in the Commission, it would be very easy to rid the markets of articles of adulterated food. The amount of money appropriated by the Legislature is entirely too small and inadequate to thoroughly carry out the work of the Commission.

I am most respectfully yours,

JOHN J. GEGHAN,
Asst. Commissioner.

REPORT OF CHEMIST.

Hon. F. A. DERTHICK, Ohio State Dairy and Food Commissioner :

SIR: The undersigned has the honor to submit the following report of chemical investigations made as chemist of the Ohio State Dairy and Food Commission, from November 15, 1887, to November 15, 1888:

TABULAR STATEMENT.

The work done comprises 110 analyses of food and articles entering into food, as well as four experiments with rabbits to test the effect of various coal tar colors employed in coloring confectionery. The following table gives the kind and number of articles analyzed and experiments made, and embraces serial numbers 251 to 364, inclusive:

Butter.....	6
Milk.....	29
Vinegar.....	11
Flour.....	4
Whisky.....	3
Candy.....	10
Maple syrup.....	2
Glucose.....	3
Candy color.....	6
Sugar.....	35
Anise seed.....	1
Experiments with candy colors.....	4
Total.....	114

BUTTER AND MILK.

Of the six samples of butter examined, four were found to be genuine and two were oleomargarine.

The twenty-nine samples of milk examined were secured from dealers in Columbus, Ohio. According to their composition as determined by the process of analysis, described in the second annual report of the Ohio Dairy and Food Commission, they may be classified as follows:

Watered.....	3
Skimmed or mixed with skim milk.....	9
Good milk.....	17

A number of the samples contained in the last category just passed the standard adopted by the City Board of Health, and of course may have been high grade milk manipulated so as to fall within the limits thus fixed.

The addition of water to milk deserves more than a passing notice, and should be condemned for much more weighty reasons than the fraud perpetrated upon the pocket-books of the consumers. From a sanitary point of view, this disgraceful practice constitutes, in the opinion of the writer, a serious crime against the public, and it is due the public that the grounds upon which this opinion is based should be set forth.

Medical science has shown in recent years that epidemic diseases are caused by specific organisms or germs, which invade the systems of those attacked. Surface water and sewage have been found to be the media through which the disease germs are disseminated. Hence wells, which are so located and constructed as to be contaminated with surface water or sewage are sure to contain these germs, when an epidemic disease is prevalent in the neighborhood. These minute organisms multiply very rapidly, when they enter a medium suitable to their life and development. Milk is such a medium. Hence milk, which has been contaminated with impure water, may, in the course of twenty-four hours, contain enough of the disease germs to cause sickness and death, even when the use of the water, with which it was contaminated, would not produce the same effects. It is well known that wells, located in barn-yards so as to be contaminated with surface drainage, although the water may seem clear and bright, are absolutely filthy. The same may be said of ordinary rain-water. It is not presumable that a person who adds water to milk for fraudulent purposes, would be over scrupulous as regards the condition of the water employed. Putting all these facts together, it becomes apparent that the addition of water to milk is fraught with imminent danger to the health and life of the consumer.

VINEGARS AND FLOUR.

Of the eleven samples of vinegar analyzed, none were found to contain free mineral acids or poisonous metals. Two samples were found to be cider vinegar; one was malt vinegar, and eight were low-wine vinegars colored with carmel or burnt sugar.

The four samples of flour which were suspected of being adulterated were found, by chemical and microscopic examination, to be perfectly pure. The per centage of ash was as follows:

No. 258. Patent, \$6.00	0.30
No. 259. Straight, \$4.50	0.40
No. 260. Low grade, \$3.85	0.70
No. 261. Straight burr	0.85

Alum, terra alba, and foreign starches were absent, and the amount of ash as given above is not in excess of what flour should contain.

CANDY AND CANDY COLORS.

The results of the examinations of candy from various parts of the State were, on the whole, quite satisfactory. Mineral adulterations, as terra alba, were entirely absent in all of the samples analyzed. Poisonous mineral colors were also absent. The hard candies contained varying amounts of glucose, while the softer kinds consisted almost wholly of glucose. As glucose is harmless and has as great a food value as cane-sugar, no objection to its use in the manufacture of candy can well be made. The red color present in greatest quantity was cochineal. But two red aniline colors, magenta or fuchsine and coraline were also found. So also the green and yellow specimens were colored with coal tar colors. As cases of poisoning by aniline colors have been reported, it was thought best to give the matter of coloring candy with these substances some consideration, in order to prohibit their employment for this purpose, if the reasons found were deemed sufficient. Four full-grown rabbits were secured to make the test. One rabbit was fed one-half gram, equal to seven and-a-half grains of magenta per day, for ten days in succession. At no time during the period could the slightest evil effect be noticed. Another rabbit was given the same amount of corallin daily for the same length of time, with the same results. The other two rabbits were fed one gram, equal to fifteen grains, respectively, of a magma of aniline, yellow and green, daily for ten days, and no bad effects could be noticed. At the end of ten days the experiments were discontinued. From these experiments it is evident that so far as rabbits are concerned the aniline colors employed and given in large doses produced no injurious effects, and it may be safe to conclude that the minute quantities necessary to color confectionery cannot well be objected to from a sanitary point of view.

SUGAR.

It is very gratifying to report that the investigation of the various brands of sugar as they are obtained from the large sugar refineries of the country, does not reveal the slightest evidence of adulteration. On account of the general public interest attached to the subject of sugar, it was thought best to give the detailed results of the analyses in the following table:

ANALYSES OF SUGARS.

No.	Water.	Ash.	Insoluble matter.	Grapesugar.	Cane sugar.	Ultra-marine.
1	0.05	none.	Trace.	0.20	99.75	Trace.
2	0.04	none.	"	0.20	99.76	"
3	none.	none.	"	0.27	99.73	"
4	1.80	none.	"	0.90	97.30	"
5	4.70	0.55	"	3.10	91.65	None.
6	none.	none.	"	0.20	99.80	Trace.
7	1.70	0.12	"	0.92	97.26	None.
8	2.55	0.18	"	1.15	96.12	"
9	3.20	0.16	"	1.39	95.25	"
10	4.22	0.16	"	3.12	92.50	"
11	4.38	0.20	"	4.16	91.26	"
12	4.20	0.70	"	5.95	89.15	"
13	4.40	1.10	"	4.35	89.15	"
14	4.10	1.10	"	4.75	90.05	"
15	4.00	1.15	"	4.16	90.69	"
16	4.00	1.21	"	5.95	89.84	"
17	4.70	1.52	"	6.25	88.53	"
18	3.80	1.45	"	5.25	89.50	"
19	4.50	1.40	"	6.65	87.45	"
20	none.	trace.	"	0.20	99.80	Trace.
21	none.	trace.	"	0.20	99.80	None.
22	1.90	trace.	"	0.80	97.30	"
23	1.85	0.05	"	1.10	97.05	"
24	4.37	0.70	"	2.75	92.18	"
25	4.25	0.60	"	2.50	92.65	"
26	4.15	0.80	"	4.50	90.55	"
27	4.32	0.70	"	7.70	87.28	"
28	4.70	0.65	"	6.65	88.00	"
29	4.76	1.50	"	7.70	86.04	"
30	4.13	0.60	"	6.65	88.62	"
31	4.58	0.90	"	5.85	89.57	"
32	0.27	none.	"	0.20	99.53	Trace.
33	0.28	0.15	"	0.22	99.35	None.
34	3.05	0.43	"	4.75	91.77	"
35	1.80	0.70	0.15	4.00	93.35	"

No. 1.	Franklin refinery, Granulated.
" 2.	" " Cut Loaf.
" 3.	" " Powdered.
" 4.	" " Confectioners' A.
" 5.	" " Extra C.
" 6.	Standard Sugar Refinery, Boston, Granulated.
" 7.	" " Confectioners' A.
" 8.	" " Iroquis A.
" 9.	" " Kennebec A.
" 10.	" " Sagamore A.
" 11.	" " Ontario A.
" 12.	" " Pembroke Ex. C.
" 13.	" " Cherokee Ex. C.
" 14.	" " Huron Ex. C.
" 15.	" " Dacotah Ex. C.
" 16.	" " Tuscarawa Ex. C.

No. 17.	Staddard Sugar Refinery, Boston,	Algonquin Ex. C.
" 18.	" "	Catawba Ex. C.
19.	" "	Chippewa Ex. C.
No. 20.	Havemyer & Elder,	Coarse Granulated.
" 21.	" "	Fine Granulated.
" 22.	" "	Standard A.
" 23.	" "	Columbia A.
" 24.	" "	Phoenix A.
" 25.	" "	Windsor A.
" 26.	" "	White Ex. C.
" 27.	" "	Empire Ex. C.
" 28.	" "	Extra C.
" 29.	" "	Golden C, steam ref.
" 30.	Matthiessen & Weichner,	Crescent Ex. C.
" 31.	" "	Extra C, steam ref.
" 32.	Louisiana, Orleans	Granulated.
" 33.	Yellow	Clarified.
" 34.	Louisiana Amber	Ex. C.
" 35.	Open Kettle Raw,	N. O.

MAPLE SYRUP.

Genuine maple syrup consists of cane sugar, grape sugar and water, together with a small amount of salts and a peculiar flavoring principle, probably an amide, to which the flavor of the syrup or sugar is due. This principle may be isolated by shaking a portion of the syrup with an equal volume of ether, and decanting the clear ethereal solution. On evaporation of the ether the flavoring principle is left in the form of a waxy mass, having a very strong odor of maple syrup or sugar. The amount of this principle is too small to serve as a basis for the determination of adulterations of genuine maple syrup. The amount of grape sugar present is usually very small even in syrup, which is undergoing incipient fermentation, and is doubtless due to the inversion of cane sugar during the process of evaporation of the juice.

The method of analysis of genuine maple syrup is simply as follows: 20 grams of the syrup are weighed off and diluted to 100 c. c. In this solution the percentage of grape sugar is determined with Fehling's solution. 20 c. c. of the above solution are placed into a beaker, diluted to about 200 c. c., ten drops of dilute hydrochloric acid added, and gently heated to boiling for half-an-hour. After cooling the solution is neutralized with potassium or sodium-hydroxide, diluted to 500 c. c., and the total amount of grape sugar determined as above. From the total grape sugar thus obtained the amount already found above is deducted and the remainder calculated as cane sugar by multiplying with 0.95.

The following analyses of genuine maple syrup will serve as illustrations:

1. Maple syrup from Delaware county—

Cane sugar	60.80
Grape sugar.....	1.80

2. Maple syrup from Preble county:

Cane sugar	62.32
Grape sugar.....	0.90

3. Maple syrup one year old undergoing fermentation:

Cane sugar	58.85
Grape sugar.....	0.55

ADULTERATED MAPLE SYRUP.

Mixtures of commercial glucose and maple syrup in various proportions have, in recent years, been branded and sold throughout the country for genuine maple syrup to such an extent as to drive the genuine article almost entirely from the market. The reason for this condition of affairs is not to be found in the taste or choice of the consu-

mer, but is due solely to the fact that the adulterated article offers a much greater margin of profit to both wholesale and retail dealers.

Commercial glucose is a mixture of grape sugar (starch sugar) and dextrine, and its presence in a suspected sample of syrup can be readily detected in the following manner by any one: Place about a teaspoonful of the syrup upon a watch glass or porcelain saucer and then add four or five drops of an alcoholic tincture of iodine. In case of the genuine syrup the iodine will soon dissipate and the original color of the syrup be restored. But if commercial glucose be present a brown coloration or precipitate will remain (dextrine reaction).

The method of analysis may be conducted as follows: 20 grams of the syrup are weighed off and diluted to 200 c. c.

1. *Grape Sugar.* After a preliminary trial an aliquot portion of the above solution is so diluted that 10 to 15 c. c. will be required to reduce 10 c. c. of the Fehling's solution. The grape sugar is then determined and the percentage calculated.

2. *Cane Sugar.* 20 c. c. of the above solution, equal to 2 grams of syrup, are diluted to about 200 c. c. and heated on a water bath for half-an-hour, with 10 drops of dilute hydrochloric acid. After cooling the solution is neutralized with potassium or sodium-hydroxide, diluted to 200 c. c., the total grape sugar determined and percentage calculated. From the result thus obtained the grape sugar found in (1) is deducted and the remainder multiplied by 0.95 will give the percentage of cane sugar present.

3. *Dextrine.* 10 c. c. of the original solution, equal to 1 gram of syrup, are placed in a prescription bottle of one or two ounces capacity, 2 c. c. of dilute sulphuric acid (1:10) added, and the bottle closed with a rubber stopper securely tied to prevent being expelled. The bottle is then placed in a salt bath and heated for four hours. The solution is then washed into a graduated cylinder or flask, neutralized with potassium or sodium-hydroxide, and the volume made up to 100 c. c. The total grape sugar present is then determined as before, and the percentage calculated. This result, diminished by the percentage of grape sugar obtained in (2) and multiplied by 0.9, will give the percentage of dextrine.

Of the syrups of this character which have been sent to the writer for analysis, two will suffice to give the public an idea of their composition.

1. Samples of maple syrup received February 11, 1887:

Cane sugar	36.16
Grape sugar.....	18.75
Dextrine	4.42

This syrup was a mixture of about two parts maple syrup and one part commercial glucose.

2. Samples of maple syrup received April 14, 1887:

Cane sugar.....	16.48
Grape sugar.....	31.25
Dextrine.....	17.91

This syrup was a mixture of about one part maple syrup and three parts commercial glucose.

The consideration of spices, glucose and other articles will be left for subsequent reports, when a larger amount of material may have accumulated.

Very respectfully,

H. A. WEBER.

Ohio State University, Columbus, O., January, 1889.

SEVENTH ANNUAL REPORT
OF THE
OHIO AGRICULTURAL
EXPERIMENT STATION
FOR 1888.

3 A. Appendix.

HON. JOSEPH B. FORAKER, *Governor of Ohio*:

SIR: I have the honor of submitting herewith the Seventh Annual Report of the Ohio Agricultural Experiment Station, for the year 1888.

Respectfully,

S. H. ELLIS,
President Board of Control.

SPRINGBORO, OHIO, *February 1, 1889.*

BOARD OF CONTROL AND OFFICERS OF THE OHIO AGRICULTURAL EXPERIMENT S

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ANNOUNCEMENT.

The Ohio Agricultural Experiment Station is organized under an act of the General Assembly of Ohio, passed April 17, 1882, and supplemented by an act of Congress, approved March 2, 1887.

The Station is prepared to test varieties of grains, fruits and garden vegetables; to examine seeds that are suspected of being unsound or adulterated; to identify and name grasses, weeds and other plants; to investigate and describe the habits of injurious and beneficial insects, and to investigate, and in some cases to suggest measures for the prevention of outbreaks of contagious, parasitic or epizootic diseases of domestic animals.

Any citizen of Ohio, who is concerned in the promotion of agriculture, has the right to apply to the Station for any information it can render, and the Station will cheerfully respond to all such communications, as far as lies in its power.

Address all communications to

EXPERIMENT STATION, Columbus, Ohio.

EXPERIMENT GROUNDS AND OFFICES

ON THE FARM OF THE

OHIO STATE UNIVERSITY, NORTH HIGH STREET, COLUMBUS, O.

REPORT OF THE BOARD OF CONTROL.

To the General Assembly of the State of Ohio :

GENTLEMEN : We submit herewith to your honorable body the seventh annual report of Director and other officers of the Ohio Agricultural Experiment Station, for the year ending 1888.

As will be seen from the statements of the Director, the past year has been one of progress, and the Station is now in a better condition to do effective work than ever before.

The magnificent appropriation from the National Government, supplemented as it has been by some aid from the State, gives the public a right to expect, and even demand, something adequate in return. That more and better results ought to be secured in the future to justify the outlay is not unreasonable to ask.

If the average unscientific farmer can do for himself all that is now done for him by the Station, our work is found wanting.

That is a defective and vicious use of public funds which returns to the public little or no benefit.

We believe that as a knowledge of the Experiment Station becomes more generally diffused among the citizens of the State, there will be an increasing demand for such help as the Station can and ought to give, and its usefulness will increase from year to year.

It is the object of the Station to advance the agricultural and horticultural interests of the State of Ohio. It desires to lift the farmer from the plane of drudgery and slavery to one of self-respect and independence. Its purpose is to teach those engaged in tilling the soil and raising useful products therefrom, how to best help themselves.

In the reports of the various officers herewith submitted, may be found complete records regarding the extent and character of the work conducted during the year, together with statements of results so far as attained.

WILLIAM R. LAZENBY,
Secretary Board of Control.

REPORT OF THE DIRECTOR.

SIR: I have the honor of submitting the seventh annual report of the Ohio Agricultural Experiment Station for the year 1888:

As stated in the annual report of this Station for 1887, the failure that year to receive the benefit of the appropriation made for the support of experiment stations under the national law, known as the Hatch act, caused the Station serious embarrassment. This embarrassment has affected not only the work of the Station for 1887, but for 1888 also, as the late date at which it became certain that the appropriation would become available for the operations of 1888 rendered impossible the execution of certain preparatory work, which should have been commenced during the fall of 1887, in order to secure a full season's work this year. The consequence is that our report of the first season's operations under the national law must be largely a report of work in preparation and under way, rather than one of work actually accomplished.

It was not until the end of January that all doubt respecting the national appropriation was dispelled. It was then too late for the inauguration of any new work, except with spring crops, and hence it was deemed advisable to spend the remainder of the winter in closing up the business of the Station under its old organization, and to leave the transfer from the old to the new management until the first of April. At that date the present director took charge of the Station, and immediately issued a bulletin giving a brief outline of its history and proposed work. For the information of those who may not have received this bulletin, it is republished with some modifications, as an appendix to the present report.

THE STATION BUILDING.

The first work to engage the attention of the Board of Control, upon the re-organization of the Station, was the erection of an office building. Hitherto the Station had been permitted to occupy some small rooms in one of the University buildings, but the increasing needs of the University for space rendered it impossible to continue this privilege, while the enlarged requirements of the Station rendered an increase of office room indispensable.

As will be seen by referring to section 3 of the Hatch act, only \$3,000

could be taken from the first \$15,000 for this purpose, and not more than \$750 per annum during subsequent years. During the winter of 1887-8 the State Board of Agriculture was endeavoring to secure an appropriation from the State treasury for the support of the Centennial Exposition, to be held during the following summer, hence it was not deemed advisable to increase the list of objects related to agriculture, for which appropriations should be asked, by making any demand at that time for help in the erection of buildings for the Station.

Acting upon this policy, the Board of Control resolved upon the construction of such a building as might be built with the funds available, hoping that the future might offer a more propitious opportunity for securing the help necessary to enlarge the building to a size sufficient to furnish proper facilities for the Station work.

A brick building, 39 by 45 feet in size, with a basement, two stories and an attic, has therefore been erected and finished so far as funds procurable would permit. The basement contains a room for heating apparatus; one for a potting room for a green-house, which it is proposed to attach to the main building, and two rooms for cellar storage. The first floor is divided into six small offices for the use of the Station officers. The second floor contains two more offices, a library, a chemical and a veterinary laboratory, and the third or attic floor is designed for a museum. It is proposed to attach to this two green-houses, one 96, the other 112 feet long, with a seed-room 16 by 20. One end of one of the green-houses is to be used as an insectary.

EXPERIMENT WORK.

In starting the experiment work of the Station, provision was first made for the continuation of the work hitherto carried on. The value of work of this character depends largely upon the length of time over which it has been conducted. In no other way can results of general application be arrived at in field experimentation than by the repetition of the work over many successive seasons. The results of a field test made this year may be very suggestive, but they cannot be accepted as more than suggestive until they have been confirmed by repeated trials under the varying conditions which successive seasons bring with them. And even then the test must be repeated upon various soils and under various conditions of exposure and climate, before its results may be accepted as decisive.

FERTILIZER TESTS.

After providing for the repetition of the tests of previous years, attention was next given to the extension of certain lines of the Station's work

into wider fields. The most important step in this direction is the preparation for a systematic study of soil fertility; this being, in our judgment, one of the most important problems towards the elucidation of which the energies and resources of our Station can be directed. Investigations on this problem have been continuously carried on here since the first organization of the Station; but, with the limited resources in land and money heretofore at command of the Station, it has been impossible to so conduct this work as to obtain satisfactory results.

By force of necessity the investigations of the Station in this direction have hitherto been conducted on a very small area of undrained, or but partially drained land, and the consequence has been that the results of the tests have been so obscured by stagnant water, either above or just below the surface, or by the relatively great influence of other natural inequalities of the soil upon the very small plots which it was necessary to use, that they give no trustworthy indications of the actual effect of the various fertilizing elements applied.

For this reason it has been decided to abandon the plot of land where this work has hitherto been conducted, and a field of very uniform soil, lying in another part of the farm, has been thoroughly drained and divided into five sections, one each being designed for the continuous cultivation of corn, oats, wheat and potatoes, both without any manure or fertilizer, and with manures of various kinds, and one for the culture of the cereal crops in rotation with grass and clover.

The accompanying diagram shows the arrangement of three of these sections, each section being divided into twenty-two plots sixteen feet wide by $272\frac{1}{2}$ feet long, and separated from each other by spaces two feet wide. Underdrains are laid under alternate divisions between the plots, so that each plot has a drain on one side or the other. It will be noted that every third plot is to be left without any fertilizer, thus leaving an unfertilized plot on one side or the other of every fertilized plot. On these plots those elements of a fertilizer which experience has shown to be most essential, namely: nitrogen, phosphoric acid and potash, are applied singly, in pairs, and in combination of all. Nitrogen is applied in different forms and quantities, and phosphoric acid in different forms; while all are contrasted with a substance valuable both as fertilizer and as feeding stuff, but which is now being chiefly shipped to foreign countries, namely: linseed oil-meal. The dotted lines indicate the drains.

DIAGRAM OF FIELD EXPERIMENTS WITH FERTILIZERS.

1. Unfertilized.
2. Superphosphate (dissolved bone-black.)
3. Potash (muriate.)
4. Unfertilized.
5. Nitrate Soda.
6. Superphosphate and nitrate.
7. Unfertilized.
8. Superphosphate and potash.
9. Potash and nitrate.
10. Unfertilized.
11. Superphosphate, potash and nitrate.
12. Superphosphate, potash and nitrate, two-thirds.
13. Unfertilized.
14. Superphosphate, potash and nitrate, one-third.
15. Superphosphate, potash and ammonia.
16. Unfertilized.
17. Nitrate, potash and rock phosphate.
18. Nitrate, potash and slag phosphate.
19. Unfertilized.
20. Barn-yard manure.
21. Linseed oil-meal.
22. Unfertilized.

In the sections devoted to crop rotation and to the culture of potatoes the contour of the surface made it necessary to run part of the drains

across instead of lengthwise of the plots ; but in both cases the drains are so arranged as to give equal drainage to all the plots.

The drainage of this field required the laying of twelve hundred rods or more of tile, a thousand rods of which had to be laid the present season. As much of the subsoil is a tough, gravelly clay, the work was tedious and expensive, and the length of time required to complete it prevented the inauguration at once of the entire system of experiments.

The sections designated for corn and potatoes were completed about the first of June, and those crops were planted then ; while the wheat and rotation work were started in the fall in good season. By another year we hope to have the entire system in operation, yet it will probably be several years before any decisive results can be attained, as the soil under test is naturally fertile, and it will require several years of the improvident practice of continuous cropping without manure to so reduce this natural store of fertility as to show clearly the effect of the different methods of treatment. The report of the Agriculturist of the Station will give the results of this season's experiments with corn, and that of the Horticulturist the results with potatoes.

CO-OPERATIVE EXPERIMENTS.

Another direction in which it is proposed to extend the work of the Station is that of co-operative work on the part of the farmers of the State. As has already been said, there are certain questions which cannot be definitely settled by field experiments in any one locality. The adaptation of different varieties of grains, fruits and vegetables to soils of different formations must be studied, as well as the behavior of these different soils under various systems of treatment. To accomplish this work the Station has asked for and is receiving the assistance of farmers in various sections of the State.

To some of these certain varieties of grains, fruits or vegetables have been sent for trial ; others have undertaken to carry on experiments in the use of fertilizers, under direction of the Station. In all such cases it is required that careful tests shall be made, and the results reported to the Station.

This work was inaugurated on the University farm before the Station was established here, and has been continued and extended since. It is our desire and purpose to still further extend it, and we hope to see the time when there shall be branch stations, directed by intelligent farmers, in every township of our State.

METHODS OF WORK.

As will be shown on the subsequent pages of this report, a very large portion of the resources of the Station has been devoted to the class of experimental research known as field or plot experimentation. That is to say, we are endeavoring to obtain *in the field* a corroboration or refutation of the theories deduced from results attained in the chemist's or biologist's laboratory, and we are giving this work precedence over mere laboratory investigation.

We do this not through any lack of appreciation of the value of laboratory research. On the contrary, none can insist more strenuously than do we upon the fundamental necessity of such work to progress in agriculture; but we believe that the investigations of the laboratory must be co-ordinated with parallel investigations in the field, and the results of one confirmed by the outcome of the other, before any solid ground can be attained in the development of a scientific agriculture.

We do not need to be reminded of the difficulties which beset work of this character on every hand. Field experimentation is no new thing to any one of the members of our staff who have such work in charge, and none can be less satisfied than are they with many of the results attained, or more fully aware of the immense obstacles that lie in the way of eventual success. But if these obstacles are insurmountable, if it be impossible to produce by this method a clear and unequivocal demonstration of the applicability of the scientific method to the art of agriculture, then the Agricultural Experiment Station must be pronounced a failure. For if the experiment station, with men trained in the work, and with all necessary appliances for executing such work, cannot produce such a demonstration, surely the ordinary farmer cannot do it. But the process whose superiority is not demonstrable on the farm will not be accepted by the practical farmer, however beautiful the theory upon which it may be founded.

Fortunately for agricultural science, however, the practicability of this method has been most thoroughly demonstrated by the oldest agricultural experiment station in the world, the Rothamsted Farm of Sir John B. Lawes. From its origin the work of the field has taken the foremost rank in that station, the laboratory being used to suggest, supplement and corroborate field work. In no other station has field experimentation been so systematically carried on as in that one, and it has furnished irrefutable evidence that persistent, well-directed effort may overcome every obstacle, and that field experimentation may reveal truths which could never have been discovered through the laboratory alone.

It is true that there is a tendency among the older experiment stations of Europe to limit their work more and more to laboratory research, and this is as it should be. When the Ohio Experiment Station is as old as these are, it is to be hoped that it will be surrounded, as are they, by a clientage of farmers, trained in the methods of field experimentation and educated to a comprehension of the principles upon which scientific experimentation must be founded, to whom much of this work may be surrendered. But we believe the shortest and most direct route to the attainment of this desirable end lies through the performance now by the Station of such work as any intelligent farmer may imitate. Such work, we believe, will more rapidly develop the spirit of research among farmers themselves, and will thus lead to a better understanding of the possibilities and limitations of scientific investigation than would the immediate entrance by the Station upon more elaborate lines of inquiry, to the neglect of these simpler questions.

In thus defending the policy of this Station we would by no means be understood as criticising those stations which have chosen a different field of labor. On the contrary, as has already been indicated, we regard that form of investigation which is chiefly conducted in the laboratory as of equal importance with that conducted in the field; and we look upon it as most fortunate that the national law, under which this work is being organized, permits such a division of labor among the various stations that one may devote its resources chiefly to the one line of research, and another to the other, each in this way supplementing the work of the other.

In brief, the kind of work undertaken by the Ohio Station is that which seems most appropriate to its existing situation and environment, as well as most likely to meet the present requirements of the agriculture of the State. In time it is hoped that the resources of the Station will justify the co-ordination of extensive laboratory work with its field research; but for the present it is deemed best to seek in the field confirmation of the results attained in other laboratories, using our own laboratories simply as a means to this end, as supplementary to our field work, rather than to divide our energies in the attempt—an attempt which, with our present resources, must be futile—to occupy the entire realm of agricultural research.

STUDENT LABOR.

In addition to the direct help which the Station will afford to the farmers of Ohio by the conduct of experimental research and the publication of results, it is hoped that it may be of an equally direct, though less extensive service, in assisting farmers' sons to secure an agricultural edu-

cation. As will be observed, the agreement between the Station and the University (see appendix) provides that the Station shall give employment to students of the University when practicable. This agreement the Board of Control and officers of the Station propose to fulfill in its true spirit, and in doing so they hope eventually to be able to help a considerable number of worthy young men.

A total of \$2,846.10 has been paid by the Station, during the nine months beginning with its reorganization and ending December 31, 1888, for labor and clerical services performed by such students, or by young men who had come to the Station during the summer with the expectation of becoming students at the opening of the fall term. In all, sixty-three students have had more or less employment at the Station at different times during the season. The majority of these have worked but a few hours each, but a considerable number have worked quite steadily, and several have earned enough to pay nearly or quite all their expenses in the University.

Under the conditions which have heretofore existed, this employment of student labor has not always been as satisfactory as could be desired, to either student or Station, for the reason that the college work which has been required of all students has consumed so much of their time and energy that the small fraction left of either has been of little value to the Station; and hence it has been necessary to look to others than students for the chief supply of the Station's labor.

I am happy to be able to announce, however, that the President and Faculty of the University manifest a lively interest in this matter, and through their co-operation a course of combined work and study is being arranged, under which it is expected that a larger portion of the manual labor of the Station may be performed by students. The plan proposed is briefly as follows:

A certain number of students in the agricultural department of the University will be permitted to take one less study during the fall and spring terms than the regular requirement, on condition that they shall be employed half of each day at the Station. The course of study and hours for recitation will be so arranged that such students may work in relays, one relay working in the forenoon and reciting in the afternoon, and vice versa. During the winter term full college work will be required, as the Station does not require so much help at that season, while during the summer vacation these students will give their entire time to the work of the Station. The number of students to whom this opportunity can be offered will of necessity be small at first, and never very large; but it is believed that the work of the Station may be so extended and adjusted that after a year or two fifteen or twenty young men, or even more, may

be regularly employed, thus enabling them to pay all the necessary cost of obtaining a thorough scientific education by their labor, and that this labor will be of itself an important factor in that education.

We believe that such employment of students is in strict harmony with both the letter and the spirit of the organic laws of the Station, and for the following reasons :

1. The students thus employed in the Station's work become an efficient means of disseminating information respecting that work and its results, and the disseminating of information is one of the first duties enjoined upon the experiment stations by the national law.

2. From among the students so employed the Station will be able at an early date to select trained and skillful workers for carrying on its more elaborate investigations.

3. Such students are from the first more serviceable than ordinary laborers in certain lines of the Station's work, such as weighing, measuring, counting, note-taking, etc.

4. Such employment assists impecunious young men in obtaining an education in the principles of scientific agriculture, and thus indirectly serves the purpose for which the agricultural colleges and experiment stations were created.

As the Station has never been able to offer employment to all students who have desired it, the policy announced at the beginning of this year of furnishing employment only to students in the agricultural department of the University must hereafter be strictly adhered to.

We receive a large number of applications for employment from those who propose entering the literary, engineering, or scientific courses of the University, but to those we can offer no assistance.

It must also be distinctly understood that the Station cannot promise to all agricultural students employment of this character. On the contrary, only a very limited number can be employed, and these must furnish satisfactory evidence that they are able and willing to perform the ordinary labor of the farm.

It must also be understood that the Station does not undertake to furnish educational labor. It is expected that an intelligent young man will be able to gather many useful suggestions relating to practical agriculture from participation in the work of the Station, but that work, under the requirements of the law, should be one of research, not of direct instruction.

PUBLICATIONS.

The national law governing experiment stations requires that "bulletins or reports of progress shall be published at said stations at least once

in three months," while the State law requires that this Station shall "make an annual report of its expenditure and work to the Governor of the State, and the same shall be published annually in the Ohio Agricultural Report, and five thousand copies separate in pamphlet form for free distribution, the pamphlet copies to be printed and paid for the same as other public printing."

In compliance with the national law, this Station has issued seven bulletins during the season, in the first of which the organization of the Station was set forth, while the other six gave briefly the essential facts concerning the outcome of certain lines of the Station's work, the object being to get this information before the people more promptly than could be done through the annual report. The substance of these bulletins, somewhat extended and amplified, in some cases, is incorporated within this report in the reports of the several officers of the Station.

It will be observed that this method of publication involves a double expense, the results of the season's work being published first by the Station in bulletin form and then re-published by the State in the annual report. Believing that this duplication might be avoided without loss to any one and with a decided saving to the Station, a joint resolution was introduced into the legislature in January, 1889, providing that the monthly bulletin of the Station shall be published by the State, and that the annual report of the Station, to be included in the report of the State Board of Agriculture, shall be limited to a mere summary of the year's operations, with financial statement, etc.

This resolution was finally passed in April, almost at the close of the session. Its effect is practically to provide for the issue of the Station's annual report, required by the State law, in monthly installments, only the summary of which will reappear in the report of the State Board of Agriculture. As the passage of this resolution would materially affect the form of the present report, it was necessary to delay the publication of this report until after the fate of the resolution should be decided.

In consequence of this change in method of publication, several papers that would otherwise have been included in the present report have been reserved for future publication in bulletin form.

THE STATION LIBRARY.

At the beginning of the year the Station possessed about 150 bound volumes, and numerous pamphlets. About 175 volumes were added during the year, the policy being to purchase such books as were needed for present work, rather than to attempt to fit out at once a complete working library. Through the courtesy of the University the Station

officers have access to the library of that institution, and they are also entitled to the use of the State library.

Through the courtesy of the various publishers, the Station is receiving the following named agricultural and other journals:

Agricultural Epitomist, Indianapolis, Ind.
 American Analyst, New York City.
 American Garden, New York City.
 American Grange Bulletin, Cincinnati, Ohio.
 Boston Weekly Globe, Boston, Mass.
 Canadian Horticulturist, Grimsby, Ont.
 Colman's Rural World, St. Louis, Mo.
 Dakota Farmer, Huron, Dakota.
 Farm and Fireside, Springfield, Ohio.
 Farm and Home, Springfield, Mass.
 Farm, Field and Stockman, Chicago, Ill.
 Farm Implement News, Chicago, Ill.
 Farm Journal, Philadelphia, Pa.
 Farm Life, Rochester, N. Y.
 Farm, Stock and Home, Minneapolis, Minn.
 Farmers' Advocate, London, Ont.
 Farmers' Home, Dayton, Ohio.
 Farmers' Review, Chicago, Ill.
 Fruit and Grape Grower, Charlottesville, Va.
 Holstein Friesian Register, Brattleboro, Vt.
 Home and Farm, Louisville, Ky.
 Husbandman, Elmira, N. Y.
 Indiana Farmer, Indianapolis, Ind.
 Journal of Agriculture, St. Louis, Mo.
 Ladies' Home Companion, Springfield, Ohio.
 Maryland Farmer, Baltimore, Md.
 Ohio Farmer, Cleveland, Ohio.
 Old Homestead, Cleveland, Ohio.
 Orange Judd Farmer, Chicago, Ill.
 Orchard and Garden, Little Silver, N. J.
 Pacific Rural Press, San Francisco, Cal.
 Popular Gardening, Buffalo, N. Y.
 Prairie Farmer, Chicago, Ill.
 Southern Cultivator, Atlanta, Ga.
 Sugar Beet, Philadelphia, Pa.
 The Press, New York City.
 The World, New York City.

Weekly Ohio State Journal, Columbus, Ohio.

Weekly Press, Philadelphia, Pa.

Western Farmer, Sioux City, Iowa.

Western Resources, Lincoln, Neb.

ACKNOWLEDGMENTS.

The Station is under obligations to the following parties for favors received between April 1 and December 31, 1888:

Chas. P. Willard & Co., Chicago, Ill., two sacks dairy salt.

J. T. Hawkins, New Lisbon, Ohio, one peck "Bearded Monarch" seed wheat.

J. M. Jones, South Charleston, O., sample of wheat from Colorado.

Hemingway's London Purple Co., New York, London Purple for exhibition and experiment.

Nixon Nozzle and Machine Co., Dayton, O., small spray pump, and packages of insecticides.

Lewis & Cowles, Catskill, N. Y., hand force pump.

Field Force Pump Co., Lockport, N. Y., Perfection spraying outfit.

John Burdett, La Salle, N. Y., 1 variety strawberry.

F. M. Cupp, Pleasantville, O., 1 variety raspberry.

J. W. Cameron, Pleasantville, O., 5 varieties of strawberries.

G. S. Deming, Cuyahoga Falls, O., 1 variety raspberry.

Geo. W. P. Gerrard, Caribou, Me., 1 variety potato.

John Stein, Piqua, O., 1 variety gooseberry.

Frank Ford & Sons, Ravenna, O., 1 variety strawberry.

W. G. Perry & Co, Covington, O., 1 variety raspberry.

F. R. Palmer, Mansfield, O., 1 variety raspberry.

Wells H. White, Troy, O., 2 varieties of grapes.

M. M. Meisse, Dumontville, O., 1 variety potato.

F. L. Wright, Plainfield, Mich., 1 variety strawberry.

Peter Henderson & Co., New York, 30 varieties of vegetable seeds.

V. H. Hallock & Son, Queens, N. Y., 12 varieties of vegetable seeds.

A. M. Nichols, Granville, O., 1 variety tomato seed.

F. H. Horsford & Co., 1 variety tomato seed.

A. I. Root, Medina O., 1 variety tomato seed.

A. W. Livingston's Sons, Columbus, O., 6 varieties vegetable seeds.

Wm. H. Maule, Philadelphia, Pa., 16 varieties of vegetable seeds.

Rob't Buist, Jr., Philadelphia, Pa., 2 varieties vegetable seeds.

Giddings & Reed, Rutland, Vt., 9 varieties of seeds.

The Nauvoo Fruit Growers' Association, Nauvoo, Ill., 1 variety strawberry.

E. A. Trout, Croton, O., 1 variety blackberry.

Stephen Hoyt's Sons, New Canaan, Conn., 1 variety grape.

Stayman & Black, Leavenworth, Kan., 2 varieties of strawberries, 1 variety of raspberries, and 9 varieties of grapes.

G. D. Howe, North Hadley, Mass., 1 variety potato.

C. E. Angell, Oshkosh, Wis., 1 variety potato.

G. W. Campbell, Delaware, O., 1 variety grape, 1 variety strawberry.

John Little, Granton, Ont., Canada, 4 varieties of strawberries.

Northrup, Braslan & Goodwin Co., Minneapolis, Minn., 10 varieties of vegetable seeds.

W. Atlee, Burpee & Co., Philadelphia, Pa., 12 varieties of vegetable seeds.

James Vick, Rochester, N. Y., 8 varieties of vegetable seeds.

Phil. Strubler, Naperville, Ill., 2 varieties gooseberry.

Chas. Betscher, Canal Dover, O., 1 variety raspberry.

Ezra G. Smith, Manchester, N. Y., 1 variety raspberry.

Thos. Crane, Ft. Atkinson, Wis., 2 varieties potatoes.

Parker & Wood, Boston, Mass., 6 varieties vegetable seeds.

CONCLUSION.

In conclusion, I must acknowledge my obligations to the Board of Control for their unwavering courtesy and constant helpfulness in the administration of the general business of the Station, and to my associate officers for their earnest and cordial co-operation in the execution of its work. Both in the general management of the Station, and in the conduct of the details of its work, the most perfect harmony has prevailed throughout the year.

Respectfully,

CHARLES E. THORNE,
Director.

To J. H. ELLIS, *President Board of Control.*

REPORT OF THE AGRICULTURIST.

LETTER OF SUBMITTAL.

SIR: I have the honor to submit herewith my first annual report of the operations of the Agricultural Department of the Ohio Agricultural Experiment Station. This report covers the calendar year, but I did not personally superintend the work until the first of April. Previous to that time it was in charge of Mr. W. S. Devol, my predecessor, who laid out the several experiments in wheat reported in the following pages; my work being that of taking notes during the growing season, gathering and caring for the crop, and reporting the results.

The lateness of the season when the work was begun, together with the unsettled condition of affairs in general, consequent upon the changes in the management of the Station, caused some delay in getting the spring crop started. The systematic draining of one field, described under my report upon corn, proved to be a large and expensive job and still further retarded the work of the season. However, the summer proved to be a favorable one for most crops, and consequently they were not materially affected by the slight variation from the ordinary time of planting.

The line of work followed during the past year has not varied materially from the plan of previous years. It seemed advisable to continue the work in the direction in which it had been well begun, for in that way only could we utilize the work of past years in getting at final conclusions.

In the experiments with wheat, oats and corn, we have been aiming to discover the best varieties for particular soils and their adaptation to particular districts of the State; to learn by practical experiment what amount of seed per acre will produce the best results; to learn whether any advantage may be derived from earlier or later seeding than is usually practiced; to investigate the effect of placing the seed at different depths in the soil, and to gather such information as is possible from different methods of seeding or of cultivation.

In addition to the foregoing, I have conducted an experiment with commercial fertilizers upon three crops. I look upon this as one of the most important lines of investigation, but the results attained in this line of work at the Station during the past year have not given satisfaction; the fault being, as I believe, wholly with the soil upon which we have to operate. It is simply too rich in plant food for the application of commercial manures to show any effect. This point is proven by the fact that the application of the same fertilizers upon poor soils in other parts of the State produced marked results.

I have conducted a field experiment with sugar beets and mangel wurzels, the object being to determine, first, what variety would give the largest yield, and second, the effect of barn-yard manure as compared with commercial manures upon this crop. I have made a partial test of several varieties of ensilage corn; a comparison of the yield of several varieties of millet; and a test of cutting timothy hay at different periods of growth. During the fall we built a large silo and filled it with ensilage corn, with which some feeding experiments are to be made before spring.

I have prepared two bulletins during the year: one in September on experiments with wheat, covering the various subjects mentioned above in connection with wheat, oats and corn, except that the experiment with fertilizers was not published because it was unsatisfactory, and the published statement would have tended to mislead rather than to guide the farmers of our State. This bulletin was largely commented upon by the press throughout the State—in fact, by agricultural papers in general. The second bulletin, published in December, gave the results of the season's experiments in the application of fertilizers to corn.

As a means of widening the usefulness of the agricultural department of the Station, we have been sending samples of various grains to farmers in different parts of the State, on condition that they report to the Station the results of the tests upon their soils. This is not only a benefit to the Station, but also to the farmers, for thus they may get new and improved varieties of grain, and at the same time the Station may learn what varieties are adapted to particular soils.

The correspondence of the department has required some time in answering questions concerning varieties of grain; questions relating to the requirements of those that received seed wheat, oats, and other seeds; and numerous questions about farm implements and about artificial manures.

Students in the agricultural department of the University have been given employment whenever practicable, and for their labor they have received twelve and one-half cents per hour. I have made an effort to give such students all the encouragement possible, and would be glad to

give them more work and more personal instruction if the University course was so arranged that I could depend upon them at regular intervals. Such labor would not be cheaper than that of ordinary farm laborers; on the contrary it would really be very much more trouble for those having the work in charge, and thus would increase the cost of superintendence; but I believe that the sons of Ohio farmers ought to have, as far as possible, the advantage of the experience that is to be gained in the work of the Station, and also the benefit of the wages they might earn. For these reasons I would be very glad to have such an arrangement between the University and the Station as would secure to agricultural students the opportunity of obtaining practical training along with the theoretical instruction of the class-room.

In conclusion, I wish to acknowledge your kind assistance in all of my work, and further to thank my associates for their suggestions and general interest in the welfare of my department.

Respectfully submitted.

J. F. HICKMAN, *Agriculturist.*

CHAS. E. THORNE, *Director Ohio Agricultural Experiment Station.*

I. EXPERIMENTS WITH WHEAT.

According to the past reports from this Station the crop of wheat last harvested was the sixth successive crop from the same ground. Following the plan of previous reports the experiments herein reported will be treated under the following general headings:

- A. COMPARISON OF VARIETIES, INCLUDING:
 - I. COMPARATIVE TEST OF VARIETIES AT THE STATION.
 - II. TEST OF VARIETIES BY FARMERS.
 - III. CLASSIFICATION OF VARIETIES.
 - B. COMPARISON OF METHODS OF CULTURE, INCLUDING:
 - IV. THICK AND THIN SEEDING.
 - V. EARLY AND LATE SEEDING.
 - VI. SEEDING AT DIFFERENT DEPTHS.
 - VII. METHODS OF SEEDING.
-

A COMPARISON OF VARIETIES.

I. COMPARATIVE TEST OF VARIETIES AT THE STATION.

The soil of the south field, which is used for experimental work in wheat, is largely made up of a clay loam and is naturally productive. The plats are one thirty-second of an acre in size, extending north and south, and are one drill-width, or eight feet wide, including dividing spaces of two feet. During the eight years that this field has been used for wheat growing it has had a top dressing of yard manure each alternate year, namely: 1881, 1883, 1885 and 1887, at the rate of twelve tons to the acre. It will be observed, therefore, that the crop of 1888 has had the advantage of the last of these top dressings.

The ground was plowed to a depth of eight inches between the 1st and 15th of August; it was rolled immediately after plowing, then har-

rowed with a Kalamazoo or spring-tooth harrow. The season being dry it was necessary to harrow the ground some eight or nine times; it was thus placed in fine condition to receive the seed, which was sowed with a Buckeye drill at the rate of about five pecks to the acre. Plats one to thirty-three, inclusive (table I), were drilled September 24th; thirty-four to forty-nine, inclusive, were drilled September 27th, while the remainder of the varieties, on account of being received late, were not drilled in until October 4th and 7th. By turning to the table of results of early and late seeding it will be readily seen that the results from the plats sowed September 23d to October 4th, inclusive, show a variation of but two bushels to the acre, and show a slight advantage in favor of the later seeding. Plats 1 to 9 cannot be justly compared with the other varieties, because they were peculiarly favored by being sheltered by a fence and shade trees. It is altogether probable that No. 1 would have given a yield equal to Nos. 2 and 3 but for the fact that it was nearest the fence and was therefore largely destroyed by those pestiferous birds, the English sparrows. A point here that may be worthy of mention is that these birds, like many others, are inclined to take the grain first from such points as give them the advantage of a hiding place—in this case they could hide in the trees which border the fence. This explanation will account for the small amount of grain in No. 1 in proportion to the amount of straw. As will be observed, No. 1 produced the largest yield of straw of any of the sixty-three varieties, while the amount of grain threshed was reduced almost to a minimum. The time of ripening of the several varieties was not as widely marked this season as in past years—there being only about seven days after the ripening of the first until the latest kinds were ready for the reaper. This I attribute to the peculiar weather, which prevailed not only here but largely throughout the State, during the wheat maturing season. The conditions were extremely warm weather, moderately dry, followed by heavy rains and high temperature. Under these conditions wheat which was comparatively green became fit for the sickle inside of four and five days. This sudden and unnatural ripening caused the wheat to shrivel, which accounts largely, as I believe, for the variation in weights of measured bushels. It will be observed that only one variety, Wyandotte Red, reached the standard weight, while the Royal Australian fell ten pounds below. The Hungarian wheat gave the largest yield, and was followed closely by German Emperor, Theiss, Early Rice and others. The Hungarian has given an average for five years of almost thirty-eight bushels to the acre. As its name indicates, it was imported from Hungary. It shows a large head, bearded white chaff and red kernel, but has the fault of being weak strawed and also of being smutty. A few notes

taken from my field note book will explain some of the light yields.
Notes taken April 24, 1888:

- No. 7—Winter killed, 20 per cent.
- No. 10—Winter killed, 10 per cent. Did not germinate, 5 per cent.
- No. 14—Winter killed, about 50 per cent. A slight wash.
- No. 17—Winter killed, about 5 per cent. Did not germinate, 20 per cent.
- No. 20—Winter killed, about 82 per cent. Did not germinate, 10 per cent.
- No. 24—Winter killed, about 12 per cent.
- No. 25—Winter killed, about 10 per cent.
- No. 26—Winter killed, about 10 per cent. Did not germinate, 10 per cent.
- No. 27—Winter killed, about 65 per cent. Did not germinate, 25 per cent.
- No. 30—Winter killed, about 10 per cent. Did not germinate, 20 per cent.
- No. 33—Winter killed, about 15 per cent. Did not germinate, 10 per cent.
- No. 54 A—Germination incomplete; about 8 per cent. winter killed.

Other valuable information can be gleaned from Tables I and II on varieties.

Where the plat number is followed by a letter it simply indicates that the plat is less than the thirty-second of an acre in size.

SMOOTH *vs.* BEARDED WHEATS.

We find by referring to table I, that out of the twelve varieties above cited, ten are smooth wheats. This would seem to indicate that the smooth wheats are less hardy and suffer more keenly from severe winters; on the other hand, the smooth wheats, taken as a whole, have given larger yields this season than the bearded varieties. The average yield of 38 varieties of smooth wheats for 1888 at the Station was 26 bushels per acre, while the average yield of 25 bearded varieties was 24.55 bushels per acre, showing a slightly higher yield in favor of the smooth wheats as a class.

In 1887 also, the smooth wheats gave a larger yield; but the reports of 1886 show results favoring the bearded wheats. The differences, however, are not very great in any case. In the three years just past the variation runs from .8 of a bushel per acre in favor of the bearded wheats to 1.55 bushels per acre in favor of the smooth wheats.

WHEAT—TABLE I—COMPARATIVE YIELD OF VARIETIES.

Variety.	Yield of grain per acre.	Weight of measured bushel.	Straw per acre.	Straw, per 100 pounds of Grain.	Date of ripening.	Color of grain.	Bearded, Smooth.
1. Geneva.....	19.7	59.5	4856	410.1	July 5.....	Red.....	B.
2. Bearded King.....	34.1	59.0	4672	228.1	" 6.....	".....	B.
3. Diehl Mediterranean.....	34.1	59.0	4064	198.4	" 10.....	".....	B.
4. Wyandotte Red.....	29.9	60.5	3488	193.9	" 8.....	".....	B.
5. Egyptian.....	32.2	59.0	3392	175.2	" 6.....	".....	B.
6. Finley.....	22.9	57.0	2496	181.3	" 3.....	".....	B.
7. Extra Early Oakley.....	16.5	57.0	1824	185.4	" 3.....	".....	B.
8. Hicks.....	27.6	59.0	3040	187.1	" 3.....	".....	B.
9. Deitz.....	22.8	58.0	2048	149.7	" 5.....	".....	B.
10. Rocky Mountain.....	19.7	58.0	2336	197.3	" 3.....	".....	B.
11. Martin's Amber.....	32.0	58.0	2464	145.6	" 7.....	White.....	B.
12. Nigger.....	32.0	57.0	2784	145.0	" 5.....	Red.....	B.
13. Democrat.....	25.0	56.0	2784	185.1	" 7.....	White.....	B.
14. McQuay.....	14.7	56.0	1632	185.4	" 3.....	Red.....	B.
15. Mediterranean.....	28.2	57.0	2880	169.8	" 9.....	".....	B.
16. Tasmanian Red.....	25.0	55.5	3104	206.3	" 7.....	".....	B.
17. Miller's Prolific.....	16.0	56.0	1728	180.0	" 9.....	White.....	B.
18. Theiss.....	36.8	58.0	3264	147.8	" 9.....	Red.....	B.
19. Hungarian.....	41.6	58.0	4736	189.7	" 3.....	".....	B.
20. Golden Prolific.....	14.6	56.0	1504	170.9	" 10.....	White.....	B.
21. Fulcaster.....	22.1	56.5	1728	130.1	" 9.....	Red.....	B.
22. Red Fultz.....	30.9	54.0	3520	189.6	" 7.....	".....	B.
23. Landreth.....	25.6	53.0	2432	158.3	" 10.....	".....	B.
24. Patagonian Trigo.....	14.9	54.0	1824	203.5	" 7.....	".....	B.
25. Royal Australian.....	18.1	50.5	2112	194.1	" 7.....	White.....	B.
26. Poole.....	17.5	54.0	1696	160.6	" 7.....	Red.....	B.
27. Surprise.....	13.1	52.0	1600	202.5	" 7.....	White.....	B.
28. Silver Chaff, smooth.....	31.4	54.5	3104	164.4	" 7.....	".....	B.
29. Tuscan Island.....	33.0	56.5	2560	129.1	" 6.....	Red.....	B.
30. Jennings.....	15.0	53.0	1952	204.8	" 9.....	White.....	B.
31. Valley.....	33.6	57.0	3424	164.8	" 7.....	Red.....	B.
32. High Grade.....	20.2	54.0	2432	200.0	" 9.....	".....	B.
33. Early Rice.....	21.8	55.5	2368	180.4	" 7.....	".....	B.

WHEAT—TABLE I—Continued.

Variety.	Yield of grain per acre.	Weight of measured bushel.	Straw per acre.	Straw, per 100 pounds of grain.	Date of ripening.	Color of grain.	Bearded. Smooth.
34. Farquhar.....	32.3	52.5	2774	143.3	July 7.....	Red.....	S.
35. Red Brazilian.....	26.6	53.0	2816	176.0	" 10.....	".....	S.
36. Red Line.....	27.7	55.5	1856	111.5	" 7.....	".....	S.
37. New Monarch.....	27.2	55.5	3232	198.0	" 7.....	".....	S.
38. Silver Chaff, bearded.....	37.3	58.5	3392	151.4	" 7.....	".....	S.
39. Witter.....	26.8	54.0	2880	179.1	" 7.....	".....	S.
40. French Prairie.....	39.4	58.0	2752	116.3	" 9.....	".....	S.
41. German Emperor.....	40.0	57.0	3488	145.3	" 7.....	".....	S.
42. Raub's Black Prolife.....	36.2	58.0	2176	114.7	" 7.....	".....	S.
43. Early Rice.....	36.8	57.0	2848	128.9	" 7.....	".....	S.
44. J. M. Allen.....	33.6	58.0	2976	147.6	" 7.....	".....	S.
45. No Name.....	24.0	56.0	2400	166.6	" 7.....	".....	S.
46. Ontario Wonder.....	25.6	57.5	1628	106.6	" 10.....	".....	S.
47. Sheriff.....	25.0	55.5	2335	155.3	" 4.....	".....	S.
48. Four Rowed-Sheriff.....	21.3	53.0	2816	220.0	" 7.....	".....	S.
49. W. F. Morningstar.....	33.6	57.5	2784	138.1	" 7.....	White.....	B.
50 A. Missouri Blue Stem.....	28.2	56.0	4452	262.5	" 9.....	Red.....	S.
50 B. Oregon.....	24.4	56.0	2756	178.9	" 7.....	".....	S.
50 C. Big English.....	30.1	58.0	3616	200.0	" 6.....	".....	S.
50 D. Hybrid Mediteranean.....	35.1	56.0	2112	100.0	" 7.....	".....	B.
51 A. Sibley's New Golden.....	37.7	58.0	1914	84.1	" 6.....	".....	B.
51 B. Michigan Amber.....	34.4	58.0	2236	108.3	" 7.....	".....	S.
51 C. Longberry.....	26.3	58.0	3616	228.5	" 9.....	".....	B.
52 A. Reliable.....	28.5	56.0	3249	190.0	" 9.....	".....	B.
52 B. Velvet Chaff.....	26.6	58.0	2368	148.0	" 6.....	".....	B.
53 A. Odessa Red.....	22.3	56.0	2496	111.4	" 10.....	".....	B.
53 B. Fultz.....	23.1	56.0	1679	121.0	" 7.....	".....	S.
54 A. Red Russian.....	19.1	56.0	2288	200.0	" 10.....	".....	S.
54 B. Gypsy.....	20.9	58.0	2294	174.4	" 9.....	".....	B.
53. Seneca Chief.....	33.0	58.0	3200	161.2	" 7.....	".....	B.

EXPOSURE OF PLOTS.—From Plat No. 8 to 33, inclusive, the exposure was about the same, but from 1 to 9, inclusive, the plats were protected by a fence and some trees.

WHEAT—TABLE II—COMPARATIVE YIELD OF VARIETIES FOR EIGHT YEARS.

No. of plant.	Variety.	Yield per acre—bushels.								No. of years under trial.	Average yield in bushels.
		1880.	1881.	1882.	1883.	1884.	1886.	1887.	1888.		
1	Bearded King.....						35.1	25.3	34.1	3	31.5
2	Big English.....								30.1	1	30.1
3	Diehl Mediteranean.....					39.2	42.7	26.9	34.1	4	35.7
4	Deitz.....						58.7	25.4	22.8	3	35.6
5	Democrat.....				45.5	35.9	40.4	24.5	25.0	5	34.2
6	Egyptian.....		22.0	27.0	44.3	30.6	41.7	28.0	32.2	7	32.2
7	Extra Early Oakly.....						36.0	26.0	16.5	3	26.1
8	Early Rice.....			27.	40.3	39.5	34.7	25.2	21.8	6	31.4
9	Finley.....			22.5	40.3	30.1	40.2	27.0	22.9	6	31.5
10	Fulcaster.....							20.3	22.1	2	21.2
11	French Prairie.....							33.5	39.4	2	36.4
12	Four Rowed Sheriff.....								21.3	2	21.3
13	Fultz.....	27.0	21.5	19.5		36.7	38.4		23.1	6	27.7
14	Farquhar.....							36.6	32.3	2	34.4
15	Geneva.....								19.7	1	19.7
16	Golden Prolific.....						46.2	22.3	14.6	3	27.7
17	German Emperor.....							20.0	40.0	2	30.9
18	Gypsy.....								20.9	1	20.9
19	Hicks.....						38.5	26.5	27.6	3	30.8
20	Hungarian.....		21.0	28.5			50.1	37.4	41.6	5	35.7
21	High Grade.....							29.1	20.2	2	24.6
22	Hybrid Mediteranean.....								35.1	1	35.1
23	Jennings.....							28.4	15.0	2	21.7
24	J. M. Allen.....								33.6	1	33.6
25	Landreth.....					31.6	39.9	32.0	25.6	4	32.2
26	Longberry.....								26.0	1	26.0
27	Martin's Amber.....					45.2	36.7	21.4	28.2	4	32.8

WHEAT—TABLE II—Concluded.

No. of plant	Variety.	Yield per acre—bushels.								No. of years under trial.	Average yield in bushels.
		1880.	1881.	1882.	1883.	1884.	1886.	1887.	1888.		
28	McQuay.....						39.1	19.2	14.7	3	24.3
29	Mediterranean.....						38.7	22.3	28.2	6	31.5
30	Miller's Prolific.....		21.5	27.0		31.0	38.2	16.5	16.0	3	23.5
31	Missouri Blue Stem.....								28.2	1	28.2
32	Michigan Amber.....		21.5	24.0		33.3	44.6		34.4	5	31.5
33	Nigger.....					36.6	51.0	24.6	32.0	4	38.0
34	New Monarch.....							36.1	27.7	2	31.9
35	No Name.....								24.0	1	24.0
36	Ontario Wonder.....								25.6	1	25.6
37	Oregon.....								24.4	1	24.4
38	Odessa Red.....								22.3	1	22.3
39	Patagonian Trigo.....						46.3	27.3	14.9	3	29.5
40	Poole.....					32.6	61.2	25.5	17.5	4	34.2
41	Rocky Mountain.....				37.7				19.7	2	28.7
42	Red Fultz.....					38.2	54.0	35.2	30.9	4	39.5
43	Royal Australian.....					40.2	49.6	38.8	18.1	4	36.6
44	Red Brazilian.....							28.2	26.6	2	27.4
45	Red Line.....							31.6	27.7	2	29.6
46	Ran's Black Prolific.....							18.7	36.2	2	27.4
47	Reliable.....								28.5	1	28.5
48	Red Russian.....								19.1	1	19.1
49	Surprise.....						41.9	32.7	13.1	3	29.2
50	Silver Chaff (smooth).....	33.0	26.0	28.5	39.0	39.7	45.2	30.0	31.4	8	34.1
51	Silver Chaff (bearded).....							32.7	37.3	2	34.5
52	Sheriff.....								25.0	1	25.0
53	Sibley's New Golden.....								37.7	1	37.7
54	Seneca Chief.....								33.0	1	33.0

The experiment with wheat in 1885 was almost a total failure, owing to the severe winter, hence the results of that year's work do not appear in the tables.

COMPARATIVE YIELD, GIVING AVERAGE OF SEVERAL YEARS.

Table II gives the yields of all the varieties at present grown upon the large plats, also the number of years they have been grown, together with the average yield, covering the number of years that each variety has been raised at the Station. This table, I think, is of greater importance than Table I, from the fact that a variety of wheat may yield well for a year or two and then fail, because of being more easily affected by drouth, by severe winters, by extreme heat, or by kinds or conditions of soil. But when a wheat yields a high rate per acre for a number of years in succession, then it should be regarded among the more reliable varieties, and as worthy of trial.

WHITE WHEATS COMPARED WITH RED.

The white varieties have yielded considerably less than the red or amber wheats this season; the average yield from nine varieties of white wheat being 21.66 bushels per acre, while the average from 54 varieties of red wheat was 27.81 bushels per acre. This, however, does not necessarily prove that the red varieties are more productive than the white varieties; for by reference to the report of this Station for 1886, page 26, we find that the average of the white varieties from 1880 to 1886, inclusive, was 32.1 bushels, while the red varieties for the same period averaged 32 bushels. During some of these years the white wheats gave the highest yields, and during other years the red wheats took the lead in productiveness. See Table III.

WHEAT—TABLE III—COMPLETE YIELD OF RED AND WHITE WHEATS.

Class.	1890.		1891.		1892.		1893.		1894.		1896.		1897.		1898.		Total.	
	No. varieties grown.	Average yield per acre.	No. varieties grown.	Average yield per acre.	No. varieties grown.	Average yield per acre.	No. varieties grown.	Average yield per acre.	No. varieties grown.	Average yield per acre.	No. varieties grown.	Average yield per acre.	No. varieties grown.	Average yield per acre.	No. varieties grown.	Average yield per acre.	No. of trials.	Average yield per acre.
White	5	29.6	11	20.5	15	24.5	8	40.0	14	36.0	11	41.7	9	27.4	9	21.6	82	30.5
Red	2	27.5	21	21.6	29	23.5	18	39.6	26	34.8	25	44.7	32	28.7	54	27.8	207	30.6

DESCRIPTIVE NOTES ON VARIETIES.

Under this head will be given descriptions only of those varieties that are not described in the report of 1887. Those wishing a description of other varieties not included here will find the descriptions of some eighty-eight varieties in the report above mentioned.

Big English.—A red, smooth wheat with a good strong straw. Yield this year, 30.1 bushels per acre.

Geneva.—Red, bearded wheat; straw rather weak; yield not fairly represented in the table on account of depredations of English sparrows.

Gypsy.—Red, bearded wheat; straw moderately strong, of medium length; stands the winter well. The indications are that it will make a hardy wheat.

Hybrid Mediterranean.—A red, bearded wheat; rather strong straw; yield this season, 35.1 bushels per acre. This wheat is known under three names, Mediterranean Hybrid, Diehl Mediterranean and Hybrid Mediterranean.

J. M. Allen.—Red, smooth wheat; straw fairly strong; berry hard; yield for 1888, 33.6 bushels per acre.

Longberry.—Red, bearded; strong straw; berry as indicated by name—above the ordinary in length; a good yielder—26.3 bushels per acre.

Missouri Blue Stem.—Red, smooth variety, not as early as some other varieties; damaged somewhat by winter killing; yield, 28.2 bushels per acre.

No Name.—(Name lost.) A red, smooth variety, furnished by the Department of Agriculture; yield, 24 bushels per acre.

Ontario Wonder.—Red, smooth; received from Canada; ripened July 10th, giving a yield of 25.6 bushels per acre; straw only moderately strong.

Oregon.—Red, smooth; also received from Canada; ripened July 7th; straw strong; yield, 24.4 bushels per acre.

Odessa Red.—A red, bearded wheat, with straw of medium strength, a plump grain and good tillering qualities; yield, 22.3 bushels.

Reliable.—A red, bearded variety, giving a yield of 28.5 bushels per acre; straw moderately strong; grain ripened July 9th.

Red Russian.—Red, smooth wheat; not very hardy; yield this year, 19.1 bushels per acre; low yield was possibly caused by winter killing.

Sheriff.—Red, smooth wheat; stiff straw; hardy; fairly prolific, giving a yield of 25 bushels to the acre.

Sibley's New Golden.—A red, bearded wheat; hardy and prolific, yielding 37.7 bushels per acre.

Seneca Chief.—A red, bearded wheat; ripens moderately early; gives indications of being a hardy wheat and a thrifty grower; straw both strong and long; yield 33 bushels per acre.

W. F. Morningstar.—The name of the originator. It is a white, bearded wheat, with moderately strong straw, and giving a yield this year of 33 bushels per acre.

The origin of many of this list of comparatively new varieties is necessarily omitted, because the data have never been received, or else have been mislaid, and are therefore not at hand. A more complete description might be given, but the foregoing includes all, perhaps, that the practical farmer cares to know.

II. TESTS OF VARIETIES BY FARMERS.

During the fall of 1887, Mr. W. S. Devol, farm superintendent, sent to various farmers in the State, small packages of different varieties of wheat for the purpose of having them tested upon different soils. During the fall of 1888 we received reports of these tests from seventeen counties. I have tabulated these reports in table IV, arranging the results so as to show each variety in a group of its own. By this means we can see the behavior of the same variety of wheat on different soils. It will be readily admitted that the composition of soil is not the only factor to be considered, but its previous treatment must also be taken into consideration. In order to get at this point more accurately, I will give subsequently some of the notes as I received them from those reporting.

WHEAT.—TABLE IV.—TESTS OF VARIETIES BY FARMERS.

Variety of wheat and name of grower.	County.	Kind of soil.	Bushels of wheat per acre.	Pounds of straw per acre.	Weight of $\frac{1}{4}$ bushel.	Date of sowing.	Date of ripening.
<i>Finley—</i>							
C. W. Bush.....	Fayette.....	Black bottom.....	13.1	.....	27.5	Sept. 28	June 28
James McCurdy.....	Richland.....	Clay soil.....	23.2	2100	31.0	" 15	July 10
Matthew Swan.....	Stark.....	Sandy.....	.....	.....	31.0	Oct. 4	" 3
J. G. Redkey.....	Highland.....	Limestone.....	20.5	2640	31.0	.....	June 26
<i>Early Rice—</i>							
Joseph Hayman.....	Wyandot.....	Clay and black.....	9.4	.....	33.0	Sept. 8	July 5
James McCurdy.....	Richland.....	Clay soil.....	18.7	1200	30.0	" 22	" 8
<i>Deitz—</i>							
James Rose.....	Scioto.....	Sandy loam.....	32.0	.....	32.0	Oct. 20	June 27
W. S. Martin.....	Hardin.....	Clay and sand.....	13.3	.....	30.0	Sept. 21	July 10
J. W. Wheatstone.....	Hancock.....	Clay and sand.....	6.6	.....	29.0	" 23	" 6
D. Kinsey.....	Allen.....	Sandy bottom.....	14.0	1750	.....	" 19	" 12
Stephen Needham.....	Washington.....	Light clay.....	9.1	.....	30.0	Oct. 5	" 3
Joseph Hayman.....	Wyandot.....	Black loam.....	20.8	.....	30.0	" 8	" 10
<i>Royal Australian—</i>							
Matthew Swan.....	Stark.....	Sandy.....	Good.	.....	31.0	Sept. 5	July 6
James Rose.....	Scioto.....	Sandy loam.....	12.8	.....	30.0	Oct. 20	June 27
Joseph Hayman.....	Wyandot.....	Loam and clay.....	10.2	.....	31.0	Sept. 18	July 8
M. E. Frazier.....	Medina.....	Heavy clay.....	19.3	.....	30.5	" 14	" 1
<i>Bearded King—</i>							
H. D. Roberts.....	Butler.....	Clay.....	30.8	.....	.....	Sept. 22	July 20
<i>Martin's Amber—</i>							
H. D. Roberts.....	Butler.....	Clay.....	21.6	.....	.....	Sept. 22	July 20
<i>Wyandott Red—</i>							
Levi Knowlton.....	Licking.....	Clay loam.....	.....	.....	.....	.....	.....

WHEAT.—TABLE IV—Continued.

Variety of wheat and name of grower.	County.	Kind of soil.	Bushels of wheat per acre.	Pounds of straw per acre.	Weight of $\frac{1}{4}$ bushel.	Date of sowing.	Date of ripening.
J. G. Redkey.....	Highland.....	Limestone clay.....	42.8	2728	32.0	Oct. 4	June 28
H. D. Roberts.....	Butler.....	Clay soil.....	24.5	.....	.....	Sept. 22	July 2
<i>Valley—</i>							
J. W. Wheatstone.....	Hancock.....	New ground.....	9.0	.....	30.0	Sept. 28	July 8
John Blaine.....	Madison.....	Clay.....	26.0	.....	29.0	" 24	" 3
James McCurdy.....	Richland.....	Clay.....	15.2	965	30.5	" 22	" 10
H. D. Roberts.....	Butler.....	Clay loam.....	19.4	.....	.....	Oct. 4	" 3
<i>Rocky Mountain—</i>							
J. P. Bush.....	Fayette.....	Black land.....	19.4	.....	29.5	Sept. 27	June 28
<i>Surprise—</i>							
J. P. Bush.....	Fayette.....	Red land.....	25.7	.....	29.5	Sept. 30	June 30
<i>Jennings—</i>							
C. W. Bush.....	Fayette.....	Black and clay.....	12.1	.....	28.5	Sept. 30	July 1
<i>Nigger—</i>							
Lewis Essig.....	Stark.....	Clay loam.....	8.3	780	30.0	Sept. 29	July 12
J. G. Redkey.....	Highland.....	Limestone.....	28.2	2120	30.5	Oct. 4	" 4
J. P. Bush.....	Fayette.....	Black land.....	17.6	.....	27.0	Sept. 27	" 30
G. M. Bulen.....	Franklin.....	Sandy loam.....	15.3	3080	27.0	" 30	.....
<i>Thies—</i>							
T. M. Bennett.....	Perry.....	Clay.....	.....	.....	.....	.....	.....
<i>Hungarian—</i>							
Henry Blue.....	Champaign.....	Sugar tree.....	21.2	.....	26.0	Oct. 8	July 7
J. M. Wheatstone.....	Hancock.....	Clay, with sand.....	14.0	.....	.....	Sept. 23	" 6

<i>Landreth—</i> Henry Blue..... N. S. Martin.....	Champaign..... Hardin.....	Sugar tree..... Clay, new.....	37.0 12.8	..... .....	24.0 29.0	Oct. 3 Sept. 21	July 13 " 9
<i>Silver Chaff—</i> Moses Hagler..... N. S. Martin.....	Greene..... Hardin.....	..... Clay, new.....	33.1 10.4	2665	25.5 30.0	Oct. 6 Sept. 21	July 7 " 11
<i>Silver Chaff—</i> D. Kinsey.....	Allen.....	Sandy bottom.....	27.5	3675	.....	Sept. 19	July 4
<i>Red Lane—</i> Frank Dill.....	Fayette.....	Red clay.....	15.6	.....	27.5	Oct. 4	July 8
<i>Fulcaster—</i> Frank Dill.....	Fayette.....	Red clay.....	19.3	.....	27.5	Oct. 4	July 5
<i>Palagonian Trigo—</i> C. W. Bush.....	Fayette.....	Black and clay.....	18.1	.....	29.0	Sept. 28	July 2
<i>Tasmanian Red—</i> Joseph Hayman.....	Wyandot.....	Black loam.....	31.0	.....	31.0	Oct. 8	July 1
<i>High Grade—</i> Stephen Needham..... Lewis Essig..... Joseph Hayman.....	Washington..... Stark..... Wyandot.....	Light clay..... Clay loam..... Black loam.....	7.3 9.9 9.0	..... ..... .....	29.0 33.0 29.0	Oct. 5 Sept. 29 Oct. 8	July 3 " 15 " 10
<i>Extra Early Oakly—</i> Matthew Swan..... Joseph Hayman.....	Stark..... Wyandot.....	Sandy..... Black loam.....	25.0 Failure.	..... .....	31.0 Failure.	Sept. 15 " 29	July 3
<i>Hicks—</i> Joseph Hayman.....	Wyandot.....	Black loam.....	20.5	.....	.....	Sept. 29	July 6
<i>Witter—</i> James Rose..... Moses Hagler.....	Scioto..... Greene.....	Sandy loam..... Clay loam.....	42.3 55.5	3585	31.0 25.0	Oct. 20 " 6	June 27 July 9
<i>Red Fulza—</i> Levi Knowlton..... James Rose..... Lewis Essig.....	Licking..... Scioto..... Stark.....	Clay loam..... Sandy loam..... Clay loam.....	33.3 19.9	2169	31.0 30.5	Oct. 20 Sept. 29	June 27 July 14

WHEAT.—TABLE IV—Concluded.

Variety of wheat and name of grower.	County.	Kind of soil.	Bushels of wheat per acre.	Pounds of straw per acre.	Weight of $\frac{3}{4}$ bushel.	Date of sowing.	Date of ripening.
<i>New Monarch—</i>							
Stephen Needham.....	Washington.....	Light clay.....	14.5	.....	29.0	Oct. 5	July 3
Joseph Hayman.....	Wyandot.....	Black loam.....	48.0	.....	32.0	" 8	" 5
Moses Hagler.....	Greene.....	Clay loam.....	19.8	2125	26.0	" 6	" 8
William L. Henkle.....	Fayette.....	Red loam.....	23.7	.....	29.0	" 1	June 27
<i>Democrat—</i>							
J. G. Redkey.....	Highland.....	Gravelly clay.....	48.0	2400	30.0	Sept. 30	July 2
<i>Velvet Chaff—</i>							
J. G. Redkey.....	Highland.....	Gravelly clay.....	36.3	4205	31.0	Sept. 24	June 25
<i>Poole—</i>							
Stephen Needham.....	Washington.....	Light clay.....	9.5	.....	29.5	Oct. 5	July 1
Lewis Essig.....	Stark.....	Clay loam.....	13.5	864	34.0	Sept. 29	" 13
John Blaine.....	Madison.....	Clay loam.....	10.6	.....	27.0	" 27	" 6
J. G. Redkey.....	Highland.....	Gravelly clay.....	21.3	1840	31.0	Oct. 1	June 28
J. W. Wheatstone.....	Hancock.....	Clay land.....	4.5	670	26.0	Sept. 30	July 6
William L. Henkle.....	Fayette.....	Black loam.....	31.4	.....	28.5	Oct. 1	" 1
D. Kinsey.....	Allen.....	Sandy bottom.....	18.3	2620	.....	Sept. 19	July 4

NOTES FROM FARMERS.

The extracts as given in the following notes are, in most cases, copied from the reports of those sending them in. The description of the soil given in the previous table is also taken directly from these reports. The varieties will be considered in these notes in the same rotation that they have been arranged in the preceding table:

Finley.

C. W. Bush, Selden, Fayette County.—Black bottom, moderately rich; previous treatment not given; "quality of grain poor; some rust, some smut; injured by chinch-bug."

J. M. Kramer, Maria Stein, Mercer County.—"So much damaged by winter and frost as not to be worth keeping separate. On account of dry weather after sowing, the wheat did not have a good start."

James McCurdy, Davis, Richland County.—Clay soil with slate gravel; clover sod worked in corn, then top-dressed with barn-yard manure; stalks harrowed down, then drilled two inches deep. "This wheat is much better than most varieties grown in this locality."

Matthew Swan, Alliance, Stark County.—Soil sandy; a light dressing of stable manure and about 100 pounds of phosphate per acre when in corn; when in oats, about 150 pounds of phosphate per acre; plowed six inches deep, a little stable manure plowed under in the poorest places, and about 200 pounds of phosphate per acre drilled in with wheat. Mr. Swan adds that the wheat did about as well as any in the neighborhood, then says that one man near had reported thirty bushels per acre, hence we must conclude that his yield must be in that neighborhood; "no smut, no rust."

J. G. Redkey, Rainsboro, Highland County.—Limestone soil; clover sod; plowed in spring and planted to potatoes; harrowed without plowing, and drilled with 100 pounds of acidulated phosphate per acre; "some rust."

Early Rice.

Levi Knowlton, Utica, Licking County.—Clay soil; timothy sod in 1884, corn in 1885, and in wheat each year since; plowed eight and one-half inches deep; wheat drilled in two inches deep with 200 pounds of ammoniated superphosphate. "This wheat was not cut, as there was so little, and it was so short that it could not be cradled."

T. M. Lawrence, Jacksonborough, Butler County.—Upland, medium dark, clay sub-soil; wheat drilled in four or five inches deep on September 16th; "yield too light to make any return. Don't think this wheat any better than some of our local varieties."

Joseph Hayman, Upper Sandusky, Wyandot County.—One-half clay and one-half black soil; wheat followed corn; ground plowed eight inches deep in the spring, harrowed and sown to wheat in the fall; on the black land wheat was good; on clay land, badly frozen out.

Jas. McCurdy, Davis, Richland County.—Clay soil with slate gravel; clover sod worked to corn, then top-dressed with barn-yard manure, stalks harrowed down and wheat drilled in two inches deep. "This wheat would have been much better if sown ten days earlier, as we have a soil that is not suitable to late sowing."

Deitz.

Jas. Rose, Haverhill, Scioto County.—Ohio river soil, sandy loam; sown October 20th, after potatoes were dug; the ground was plowed six inches deep, harrowed and rolled, then drilled without fertilizer.

W. W. Reynolds, Utica, Licking County.—Reports that his wheat was all winter-killed so that it would not produce over eight bushels per acre, hence no report of yield.

W. S. Martin, Dunkirk, Hardin County.—Clay soil, mixed slightly with sand; new ground, farmed in potatoes two years, lightly manured both years; no smut, but a little rust; "We think it a good variety for this locality."

J. W. Wheatstone, Van Buren, Hancock County.—Heavy clay soil, moderately fertile, sand on highest points; in potatoes previous to the wheat; plowed six inches deep; wheat drilled; "not as good in this neighborhood as Fultz."

D. Kinsey, Henning, Allen County.—Sandy bottom; ground had been in pasture ten years; plowed spring of 1887 and planted to potatoes; harrowed after taking off potatoes, dragged and then drilled in wheat; "lodged some, probably fifty per cent."

Jos. Hayman, Upper Sandusky, Wyandot County.—Soil black loam; plowed for corn in spring of 1886, eight inches deep; after the corn was cut the ground was harrowed and the wheat drilled in; "stood the winter well, but not as well as Tasmanian Red."

Geo. Tinsler, Marshallville, Wayne County.—Soil gravelly, slightly sandy upland; clover and timothy sod, planted to corn in spring of 1886; stalk ground planted in wheat after plowing four inches deep; "wheat did not yield well, but did not have a fair chance, because it was put in too late in the fall."

T. M. Lawrence, Jacksonborough, Butler County.—Upland, medium dark surface, clay sub-soil; no rest for 20 years until 1886; poor clover sod seed bed; "no rust, no smut; think this and Fulcaster wheat will prove good here."

J. M. Allen, Hagler, Fayette County.—Soil, clay loam; had been heavily manured in spring and planted in sweet corn; after the corn was cut and hauled off, the wheat was drilled in; stood the winter well and promised a good yield, but the chinch-bug destroyed its chances."

Stephen Needham, Dunham, Washington County.—Light clay soil; planted to potatoes in spring of 1887, plowed in fall and drilled wheat with Buckeye drill; "no smut, no rust; yield light on account of winter-killing; low places in plot caused it to winter-kill."

Royal Australian.

Matthew Swan, Alliance, Stark County.—Sandy soil; grass two years, corn one, oats one; manured when in corn; one hundred to one hundred and fifty pounds of phosphate when in oats; plowed 1st of September, manure plowed under, 200 pounds of phosphate put on and the wheat drilled in; "when cutting wheat thought it would yield better than Finley or extra Early Oakley; it was not so thick on the ground, but the heads were much longer."

Jas. Rose, Haverhill, Scioto County.—Ohio river soil, sandy loam; wheat drilled October 20th, after potatoes were dug; "think it will compare favorably with other varieties grown here."

Joseph Hayman, Upper Sandusky, Wyandot County.—Clay loam, corn stubble well cultivated; plowed in spring eight inches deep; "in black soil the wheat did very well, but upon the clay soil it was almost a failure."

M. E. Frasier, Seville, Medina County.—Heavy clay soil sloping to the north, clover sod followed by oats, then Royal Australian wheat; plowed August 29th seven inches deep, ground put in good condition, then drilled in wheat at rate of seven pecks per acre "better than Blue Stem sown in same field under same conditions; was badly winter-killed on part of piece."

Bearded King.

H. D. Roberts, Riley, Butler County.—Clay soil; wheat was sown with a one-horse grain drill; "no smut, but some rust."

Martin's Amber.

H. D. Roberts, Riley, Butler County.—Clay soil; wheat was sown among corn stalks with a one-horse grain drill; "no smut, no rust."

John M. Kramer, Maria Stein, Mercer County.—No account of kind of soil; simply reports: "So much damaged by winter-killing that we have no report to make. The drought in the fall kept the wheat plants from getting a fair start."

Wyandotte Red.

George Tinsler, Marshallville, Wayne County.—Soil gravelly, slightly sandy, upland; clover and timothy sod planted to corn spring of 1887; stalk ground when planted to wheat; manured when put in corn; plowed September 20th; wheat drilled in; "sowed or drilled the wheat in dust and it continued dry until winter set in, so that the wheat never got a good start, hence we have to report a failure."

Levi Knowlton, Utica, Licking County.—Clay loam; had been in wheat three years; before that one year in corn after a light sod; plowed September 20th, eight inches deep; drilled in with 200 pounds of superphosphate per acre; "smallest yield except Early Rice wheat, which was not cut."

J. G. Redkey, Rainsboro, Highland County.—Limestone clay; clover sod, plowed in spring and planted to potatoes; after taking off the potatoes the wheat drilled in with 100 pounds of acidulated bone per acre; "one of the best of the new varieties sent me; it is early, productive, stands up well and tillers well."

H. D. Roberts, Riley, Butler County.—Clay soil; drilled among corn with a one-horse grain drill; some smut and some rust; yield not reported.

D. G. Wenrick, Bradford, Miami County.—No report of any kind returned.

Valley.

J. W. Wheatstone, Van Buren, Hancock County.—New ground, in corn this season; stalks harrowed both ways and the wheat drilled September 28th; "about equal to the Fultz growing beside it; wheat was all poor through this region."

John Blaine, Mt. Sterling, Madison County.—Clay loam; clover sod broken for corn; harrowed for wheat, and sown with common 8-hoe drill; "think this wheat is better than any other variety upon my farm; would call it extra."

Jas. McCurdy, Davis, Richland County.—Clay soil; with slate gravel; clover sod worked to corn; stalks harrowed down; wheat drilled about two inches deep at rate of five pecks per acre; "this wheat yields about the same as other varieties; but in quality is poor; would have been much better if it had been sown earlier."

H. D. Roberts, Riley, Butler County.—Clay loam, with a sand and gravel subsoil; plowed about the 26th and 27th of September, six to eight inches deep; wheat was drilled with Farmer's Friend grain drill.

George Tinsler, Marshallville, Wayne County.—Gravelly and sandy upland; clover and timothy sod; manured when plowed for corn; plowed September 20th for wheat; ground was well prepared and then the wheat was sown broadcast; "am well pleased with the above wheat; the dry weather and late sowing caused my failure with it."

Rocky Mountain.

J. P. Bush, Selden, Fayette County.—Black land that was planted in corn in the spring; it was a sod; was drilled in wheat in fall after corn; "this wheat seems to be up with the average small grain wheats."

Surprise.

C. W. Bush, Selden, Fayette County.—Red land to which manure had been applied two years before; wheat drilled September 30th; "this wheat has the right name, and everyone who sees it thinks it splendid; no chinch-bugs in it."

Jennings.

Levi Knowlton, Utica, Licking County.—Clay gravel; in corn in 1885, in wheat since; plowed September 1st, nine inches deep, well harrowed, drilled two inches deep with 200 pounds of superphosphate; "better than Wyandotte Red, not so good as Red Fultz; not so good as Crawford County."

C. W. Bush, Selden, Fayette County.—Black clay, mixed; corn ground; top-dressed with manure after being drilled with the above wheat; "this wheat was badly damaged by the chinch-bugs, and I cannot give a very correct idea of it."

Nigger.

Lewis Essig, Canton, Stark County.—Clay loam, gravel subsoil; three cords of manure to the acre, then a crop of potatoes taken off; plowed September 27th, eight inches deep; wheat sown broadcast and harrowed in; "part of the seed was weevil-eaten, and it gave a poor stand to start with."

J. G. Redkey, Rainsboro, Highland County.—Limestone soil; clover sod, plowed in spring and planted to potatoes; harrowed October 3d; wheat drilled with 100 pounds of acidulated bone per acre; "not as good a variety as some others; too late a wheat for our locality."

J. P. Bush, Selden, Fayette County.—Black land; sod plowed in spring and put in corn; after the corn was taken off, was drilled in wheat on September 27th; "some black rust; this wheat has been raised here for five years, and has been a standard wheat, but this year is not so good; the chinch-bug damaged it considerably."

G. M. Bulen, Lockbourne, Franklin County.—Sandy loam; manured in fall of 1885, planted to potatoes spring of 1885, also in 1886; plowed September 29th, six inches deep, wheat drilled September 30th.

Golden Prolific.

J. P. Bush, Selden, Fayette County.—Black land; sod broken in spring and planted in corn; wheat drilled in September 27th; "considerable rust and not very good straw."

G. M. Bulen, Lockbourne, Franklin County.—Sandy loam; manured in fall of 1884, also in 1886; plowed September 29th, six inches deep; wheat drilled in September 30th; "yield and quality better than the average of the neighborhood; dry weather in fall interfered with it considerably."

Theiss.

T. M. Bennett, Somerset, Perry County.—Clay land; sod had been broken two years before and two crops of corn grown upon it, after the land had been idle for twenty years; corn-stalks harrowed, bone-meal applied at the rate of 300 pounds per acre; wheat sown broadcast and harrowed in; "the ground was wet and the wheat winter killed."

Red Brazilian.

T. M. Bennett, Somerset, Perry County.—Drilled with 150 pounds of bone-meal per acre; "I think it will prove a profitable variety for our climate."

Farquhar.

T. M. Bennett, Somerset, Perry County.—Same as for Theiss wheat above.

Hungarian.

Henry Blue, Cable, Champaign County.—Sugar tree land; plowed in the spring, eight inches deep, planted to potatoes; wheat drilled in October 3d; "some smut, some rust; early, plump, and probably a little weak strawed."

J. W. Whedstone, Van Buren, Hancock County.—Clay and sandy soil; sowed in oats in the spring, manured in fall with barn-yard manure; plowed in September, and wheat drilled September 23rd; "better than the Fultz."

Landreth.

Henry Blue, Cable, Champaign County.—Sugar tree land; plowed in the spring; further treatment the same as for Hungarian above; "this wheat seems a little late for our locality; rusted very badly this season."

N. S. Martin, Dunkirk, Hardin County.—Clay, new land; in corn one year, potatoes one, then in wheat, after the potatoes; drilled on September 21st; "equal to any I know of, except Deitz and Silver-Chaff."

Silver-Chaff.

Moses Hagler, Xenia, Greene County.—An old garden patch; had been in wheat one year before this wheat was sown upon it; has had lots of manure put on it, and is therefore strong; ground plowed August 5th and 6th, was top-dressed with stable manure and the wheat drilled; "no smut; this variety was better than most varieties grown in this section; better than Valley or Fultz."

N. S. Martin.—Same as for Landreth, raised by same man; he says further: "We think it well worth a further trial."

Silver-Chaff, Bearded.

John M. Kramer, Maria Stein, Mercer county.—Clover land, clay soil; plowed, harrowed and drilled; "on account of dry weather, plants entered winter in poor condition, consequently froze out."

D. Kinsey, Henning, Allen County.—Sandy bottom; ground had been in pasture for ten years; plowed in spring of 1887, planted in water-melons; thoroughly harrowed and prepared for wheat, which was sown or drilled on September 19th; "this variety compares favorably with other varieties."

Red Line.

Frank Dill, Parrot's, Fayette County.—Red clay soil; had been in wheat the two preceding years; plowed August 5th, five inches deep, wheat drilled; "yield was very good for this year; didn't seem to stand the winter very well."

Fulcaster.

T. M. Lawrence, Jacksonborough, Butler County.—Upland, medium dark soil, clay sub-soil; plowed in September, four or five inches deep, wheat drilled; "a good yield, and with more favorable season will be a valuable variety, from present indications."

Frank Dill.—Same conditions as for Red Line; "yield very good to amount of straw, and quality as good as almost any variety in this section for this year."

Tuscan Island.

J. W. Merryman, Hilliard, Franklin County.—"Sowed the wheat October 5th well; wintered fairly; was later than the Mediterranean, and was destroyed by bugs; did not cut the wheat at all."

Patagonian Trigo.

C. W. Bush, Selden, Fayette County.—Clay and black loam; corn stubble; sown in the spring; corn removed and wheat drilled in among the corn-stalk; "cold hurt it some, or the yield would have been much better; this wheat has no appearance, but the straw seems a little soft."

W. W. Reynolds, Utica, Licking County.—No report.

Tasmanian Red.

W. W. Reynolds, Utica, Licking County.—No report.

Joseph Hayman, Upper Sandusky, Wyandot County.—*Black loam; plowed in the spring, thoroughly cultivated in the fall, wheat drilled October 8th will compare with any, except New Monarch."

High Grade.

Stephen Needham, Dunham, Washington County.—Light clay subsoil; sod in the spring of 1887, and planted to early potatoes; plowed in fall, and wheat drilled October 2d; "large per cent. winter-killed; heads small, yield small."

Lewis Essig, Canton, Stark County.—Soil, clay loam, gravel subsoil; mowed in the spring, farmed in potatoes, then plowed again in September and wheat sowed and harrowed in; "not equal to other varieties; it may grow to be a good variety."

Joseph Hayman, Upper Sandusky, Wyandot County.—*Black loam; plowed in the spring, corn about eight inches deep in April; thoroughly harrowed before seeding, the wheat "rusted badly; wheat not very good did not stand the winter well."

Extra Early Oakley.

Matthew Swan, Stark County.—*Soil sandy; in grass two years, in oats in the spring, plowed first week in September six inches deep, wheat put in with a drill; "the quality about equal with any grown here."

Joseph Hayman, Wyandot County.—Same as for High Grade; "wheat almost a failure."

Hicks.

Joseph Hayman, Wyandot County.—Same as for High Grade and Extra Early Oakley; "I think will yield with any smooth wheat."

Witter.

Jas. Rose, Haverhill, Scioto County.—Same as for Democrat; "the quality of the wheat about equal to seven other varieties which I grew upon the same soil; no smut, no rust."

Moses Hagler, Xenia, Greene County.—Clay loam; used for a truck patch for the first year; no manure used; plowed the day before sowing wheat, October 6th drilled; "wheat as good as most of the varieties sown here; stood the winter well."

Red Fultz.

Levi Knowlton, Licking county.—Clay loam; a light sod, plowed up for corn in 1885, since that time it has been in wheat; drilled in September 22, 1887; "variety next best to Poole and Crawford County."

Jas. Rose, Scioto County.—Same as for Democrat and Witter; "I think more of the Red Fultz than any other variety that I have raised, except the Poole."

Lewis Essig, Canton, Stark County.—Same as for High Grade; "yield satisfactory; I believe, the best; I believe this variety is well adapted to this soil and climate."

New Monarch.

Stephen Needham, Dunham, Washington County.—Same as for High Grade; "some smut, no rust; the New Monarch and Poole had much larger heads than our varieties, but the weight and hardness of grain were no better."

Joseph Hayman, Wyandot County.—*Same as for High Grade; "I think it is the wheat to sow here; yield better and quality as good as I know of."

Moses Hagler, Greene County.—Same conditions as for Silver Chaff; "some smut, some rust; not as good with me as Valley, Silver Chaff, Red Fultz, Hybrid Mediterranean or Bearded King; better than Early Rice, Fultz, Martin's Amber or Tasmanian Red."

T. M. Bennett, Perry County.—No report.

Wm. L. Henkle, Fayette County.—Red loam; lightly manured; wheat drilled in October 1st; "tillered very well; smutted pretty badly, also some black rust; this seems to be a good wheat, stood the winter well; the yield would probably have been larger had it not been for the large per cent. of smut."

Democrat.

J. G. Redkey, Highland County.—*Gravelly clay; clover and timothy sod, plowed in spring and planted in corn; was not plowed again in the fall, but harrowed both ways with Acme harrow, after which the wheat was drilled; one of the best wheats we have; it has stood the best for the last five years with me."

Velvet Chaff.

J. G. Redkey, Highland County.—*Gravelly clay, underlaid by limestone; timothy pasture turned under for corn; ground was not plowed in fall, but was thoroughly drilled, and 100 pounds of acidulated bone drilled with it; "excelled only by Tuscan Island; was injured some by the fly."

Poole.

T. M. Lawrence, Butler county.—Same conditions as Fulcaster; "better quality, but quality not so good as Deitz or Fulcaster; wheat was a general failure in this neighborhood, the best probably not producing over ten bushels per acre."

D. Kinsey, Henning, Allen County.—Same as for Deitz; "no smut, but badly rusted; yield was better than the average in our vicinity; the muskrats and sparrows both did some damage to this wheat."

Wm. L. Henkle, Fayette County.—Black loam; sod plowed for corn in spring, wheat drilled in the stalk ground in fall; "about as good as any other grown in this locality; wet weather caused it to rust considerably; chinch-bug also did considerable damage in this county."

J. W. Whedstone, Hancock County.—Clay land, manured last spring and planted to

sweet corn, wheat drilled among corn stalks; "yield as good as the average; all wheat poor in this section."

J. G. Redkey, Highland County.—*Same as for Democrat; "about average yield."

John Blaine, Madison County.—*Same as for Valley; "I gave it a fair chance, but it did not yield with Silver Chaff or Poole."

John M. Kramer, Mercer County.—Same conditions as Silver Chaff; same report.

Lewis Essig, Stark County.—Same conditions as for High Grade; "a good variety; yield about equal to other varieties grown here."

Stephen Needham, Washington County.—Same conditions as for High Grade; "yield slightly below other varieties grown here; quality of the grain very good; ripened earlier than any other varieties sent to me; heads large and well filled, straw short."

Several of the notes on the foregoing pages are marked *. This means that the experimenters are trying the variety a second time, using seed of their own growing. These tables with notes from the several counties should be of considerable assistance to farmers in determining what kinds of wheat are best adapted to their soils. Out of eighteen or twenty counties reporting wheat, it will be observed that but two, Fayette and Franklin, have reported damage from chinch-bug. The chinch-bugs were also very plentiful upon the Station farm last harvest, but did no material damage. They did not attack other crops after the wheat was cut, at least not so as to do any perceptible mischief.

III. CLASSIFICATION OF WHEATS.

About 270 differently named sorts of wheat were grown on the Station farm the past season. The object of this work is, (1) to test the adaptation of various sorts to the soil and climate of Ohio; (2) to ascertain whether so-called varieties are true to name, and to determine synonyms, and (3) to accumulate a stock from which to develop new varieties through crossing.

As a first step towards a systematic prosecution of this work, it is necessary to arrange the various sorts in groups, placing in the same group those varieties showing the greatest number of points of resemblance to each other. In the fourth annual report from this Station the varieties were first divided, as they are in this report, into bearded and smooth. In the fifth and sixth reports the color of the grain was made the basis of the first division. There are various objections to making the color of the grain the primary basis of classification. The red, amber and white wheats shade into each other by such imperceptible gradations that even a practiced eye cannot always draw a sharp line of demarkation between them, and this difficulty is aggravated by the fact that differences of soil, and especially of season, have a slight effect upon the color of the grain. While, therefore, this characteristic must be made use of as one of the features of any practical classification,

it must be relegated to a secondary place. For this reason we have divided the varieties first into the two classes, bearded and smooth, and subdivided these classes into white- or bronze-chaffed, these again being grouped according as the grain is red or white. This arrangement is not without its objections, and it is quite probable that after a more thorough study of this matter of classification we shall have further modification to propose.

The following is a synoptic chart of the classification adopted in this report:

<i>Class.</i>	<i>Sub-Class.</i>	<i>Group.</i>
I. Bearded.	A. Chaff bronze.	{ 1. Grain red.
	B. Chaff white.	{ 2. Grain white.
II. Smooth.	C. Chaff bronze.	{ 3. Grain red.
		{ 4. Grain white.
	D. Chaff, white.	{ 5. Grain red.
		{ 6. Grain white.
		{ 7. Grain red.
		{ 8. Grain white.

CLASS I. BEARDED.

SUB-CLASS A.—CHAFF BRONZE.

Group 1.—Grain Red or Amber.

Andrews.
Boyer.
Brady Lake.
Buckeye.
California Blue Stem.
Cornell No. 4.
Dallas.
Diehl Mediterranean.
Fulcaster.
Granwalt.
Golden Crown.
Hungarian, No. 2.
Hungarian, No. 3.
Hybrid Mediterranean.
Lancaster.
Longberry Red.
Mediterranean.
Meekins.
Michigan Bronze.

Nebraska.
Ohio Swamp.
Raub's Black Prolific.
Red Odessa.
Red Amber.
Red Russian.
Red Sea.
Scott's Bearded.
Sibley's Hybrid.
Sibley's New Golden.
Sibley's New Hybrid.
Seneca Chief.
Swamp.
Tasmanian Red.
Triticum.
Velvet Chaff.
W. F. Morningstar.
Wild Goose.

*Group 2.—Grain White. None.***SUB-CLASS B.—CHAFF WHITE OR STRAW-COLORED.***Group 3.—Grain Red or Amber.*

Alabama.
American.
Bearded King.
Bennett.
Canada Club.
Canadian Wonder.
Egyptian.
Geneva.
Golden Prolific.
Half Beard.
Hungarian, No. 1.
Hungarian, No. 8.
Hungarian, No. 4.
Hungarian, No. 6.
Hungarian, No. 10.

Mennonite.
Michigan Wick.
Nigger.
No Name.
Ohio Amber.
O. K.
Reliable.
Russian.
Silver Chaff Bearded.
Theiss.
Treadwell Bearded.
Tuscan Island.
Valley.
White Blue Stem.
White Chaff.

Group 4.—Grain White.

Democrat

Jennings.

CLASS II.—SMOOTH.**SUB-CLASS C.—CHAFF BRONZE OR REDDISH.***Group 5.—Grain Red or Amber.*

Blue Stem.
Early Ripe.
Farquhar.
Fountain.
French Imperial.
German Emperor.
Hungarian, No. 9.
Hungarian, No. 12.
Knapp.
Mammoth Red.
Manitoba.
McGee's Red.
McLenay.
Mediterranean Red Chaff.

Michigan Amber.
Michigan White.
Minnesota Hard Fife.
Oregon Club.
Patagonian Trigo.
Poole.
Red Brazilian.
Red Fultz.
Red Line.
Sandomirka.
Siberian.
Southern Amber.
Wales.
J. M. Allan.

Group 6.—Grain White.

on l No. 2. an No. 2. n. e.	Royal Australian. Rural No. 5. Shumaker-Clawson. White Eldorado. Winter Pearl.
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SUB-CLASS D.—CHAFF WHITE OR STRAW COLORED.

Group 7.—Grain Red or Amber.

rn. r. ore. ame. ay. nglish. d's Velvet Chaff. ian Express. nial. ion Amber. lain. l No. 1. l No. 3. Egyptian. an. May. Rice. on Fife. ium. Early Oakley. . Prairie. Clawson. Straw. Dust. ee Amber. n. an. rian No. 7. rian No. 11. rian White Chaff. rade. l No. 9. No. 17. No. 18. No. 21. s Second Premium. ed Fife. s.	Kentucky White. Little Red. Longberry. Lost Nation. McCracken. Missouri Blue Stem. Missouri. New York Flint. New Monach. Oakley. Ostery. Palestine. Porter. Powers. Pure Gold. Purple Straw. Red May. Rice. Rio Grande. Rocky Mountain. Rogers. Russian May. Scott. Scott, smooth. Small Frame. Soules. Tappahannock. Travis. Tennessee Amber. Washington. Washington Glass. White Rose. Wintergreen. Wyandotte Red. Wysor. Yellow Blue Stem. York White Chaff. White Rogers. Walket. White Velvet Chaff. Zimmerman. Zimmerman No. 2.
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Armstrong.
 Arnold's Hybrid.
 Earnhardt.
 Gold Medal.
 Gold Premium.
 Golden Prolific.
 Landreth.
 Martin's Amber.
 McPherson.
 Miller's Prolific.
 Moon.

Silver Chaff.
 Square Head.
 Surprise.
 Russian No. 2.
 Treadwell Smooth.
 Velvet Chaff Bald.
 White Mountain.
 White Fultz.
 White Chaff.
 Wild Goose.

In addition to the two hundred and more so-called above classified, we have between thirty-five and forty crosses, w not been classified. There is here a broad field of investigation we hope to give more attention in the future; namely, the de synonyms among the great number of so-called varieties. V to have given it more time the past season, but other work dema time and attention during that season when this work should going on.

COMPARISON OF METHOD OF CULTURE.

THICK AND THIN SEEDING.

Table IV represents the continuation of the experiment of thin seeding, which has been repeated upon the same groun years past. The treatment of the plats has been identical, all bei and harrowed upon the same dates, and the same implements b in tillage and in drilling. They were all drilled in on Septer with Buckeye drill, no fertilizers nor manures of any kind bei. Velvet Chaff was the variety of wheat sown. The parts of these were lodged were in a depression in which the surface soil had been collecting a little at a time from year to year.

Table V shows averages of several years, as well as the resu successive year in thick and thin seeding. It will be noticed seven pecks per acre plat shows a slightly higher yield than a rest, yet the difference is only slight. The most surprising thin developed in this experiment is that the three-peck plat has give the average of which, for a period of seven years, is almost as hi highest, and shows a better rate per acre than the plat which seed at the rate of eight pecks per acre. It would seem probable from the results of these experiments, that the available plant fo

WHEAT—TABLE V—THICK AND THIN SEEDING.

Plat number.	Quantity of seed sown, per acre.	Yield of grain, per acre.	Yield of straw, per acre.	Yield of straw, per 100 lbs. of grain.	Lodged.
1.....	Two pecks.....	<i>Bushels.</i> 14.9	1280	142.8	13 per cent.
2.....	Three pecks.....	43.2	3744	144.5	12 per cent.
3.....	Four pecks.....	40.5	3968	163.1	00 per cent.
4.....	Five pecks.....	43.7	4352	165.4	00 per cent.
5.....	Six pecks.....	44.2	4192	157.9	00 per cent.
6.....	Four pecks.....	44.2	2976	112.0	00 per cent.
7.....	Seven pecks.....	48.4	5056	173.8	25 per cent.
8.....	Eight pecks.....	48.4	5120	176.0	14 per cent.

WHEAT—TABLE VI—THICK AND THIN SEEDING, COMPARISON OF SEVEN YEARS.

Plat number.	Quantity of seed sown, per acre.	Yield of grain per acre, bushels.							Number of years of trial	Average for series of yrs.
		1878.	1879.	1883.	1884.	1886.	1887.	1888.		
1.....	Two pecks.....	.....	29.6	25.9	.....	42.6	36.9	14.9	5	29.9
2.....	Three pecks.....	32.2	30.5	36.1	35.6	43.0	39.3	43.2	7	37.1
3.....	Four pecks.....	.....	34.2	30.2	33.7	42.2	40.7	40.5	6	36.9
4.....	Five pecks.....	33.7	34.9	37.9	41.9	42.2	38.1	43.7	7	38.8
5.....	Six pecks.....	35.6	.....	29.6	37.6	38.9	40.7	44.2	6	37.7
6.....	Seven pecks.....	37.5	35.9	37.3	39.8	37.0	43.8	48.4	7	39.9
7.....	Eight pecks.....	37.5	.....	25.6	38.0	28.6	40.5	48.4	6	36.4
8.....	Nine pecks.....	31.5	34.2	33.9	37.0	.....	.....	.....	4	34.1

EARLY AND LATE SEEDING.

The question of early and late seeding is one of importance, and one upon which there is a wide diversity of opinions. It is probable, however, that the variation of seasons has more to do with the results than the time of seeding. During the past year the plats have been given the same treatment. They have been plowed, harrowed, rolled and drilled upon the same days. This we do not think the best method, because it does not give the proper preparation of the seed bed, from the fact that cultivation alone is not all that is required, but Nature's workings upon the soil are also essential to its thorough preparation to receive the seed. Carefully prepared notes, during the fall, after seeding, are not at hand, hence we must leave the reader to study Table VII, and draw his own conclusions. In connection with this we will add Table VIII, giving the averages of early and late seeding over a series of years, which will give a more conclusive answer to the question, "When shall I sow my wheat?"

WHEAT—TABLE VII—EARLY AND LATE SEEDING.

Number of plat.	Time of seeding.	Quantity of grain, per acre.	Amount of straw, per acre.	Amount of straw per 100 lbs. of grain.
1.....	August 23d.....	12.8	1536	200.0
2.....	August 30th.....	11.2	1632	242.8
3.....	September 6th.....	12.1	1120	145.8
4.....	September 13th.....	26.6	2880	180.0
5.....	September 20th.....	26.6	2752	172.0
6.....	September 27th.....	26.1	2336	155.3
7.....	October 4th.....	28.2	2336	137.7
8.....	October 11th.....	33.0	3200	161.2
9.....	October 18th.....	20.8	1952	156.2
10.....	October 25th.....	27.7	1984	119.2
11.....	November 1st.....	22.9	2744	199.4

FALL DROUTH.—The very dry weather during August and the early part of September, 1887, doubtless had its serious effects upon the three plats sown previous to the 6th of September.

WHEAT.—TABLE VIII.—EARLY AND LATE SEEDING—SERIES OF TRIALS.

1883.		1884.		1886.		1887.		1888.		Average Yield.
Date seeded.	Yield, per acre.	Date seeded.	Yield, per acre.	Date seeded.	Yield, per acre.	Date seeded.	Yield, per acre.	Date seeded.	Yield, per acre.	
August 25.....	24.1	August 25.....	35.8	August 29.....	41.2	August 23.....	31.7	August 23.....	12.8	29.1
September 1.....	40.0	September 1.....	51.8	.....	.....	August 30.....	31.6	August 30.....	11.2	33.8
September 8.....	34.9	September 8.....	55.6	September 10.....	32.3	September 6.....	28.3	September 6.....	12.1	32.6
September 15.....	42.4	September 15.....	57.2	September 17.....	35.0	September 13.....	31.3	September 13.....	26.6	38.5
September 22.....	36.9	September 22.....	53.2	September 24.....	38.6	September 20.....	27.8	September 20.....	26.6	36.6
September 29.....	47.1	September 29.....	54.6	October 1.....	42.1	September 27.....	26.1	September 27.....	26.1	39.2
October 6.....	34.7	October 6.....	56.9	October 8.....	36.5	October 4.....	32.7	October 4.....	28.2	37.8
October 13.....	38.0	October 13.....	44.4	October 15.....	38.0	October 11.....	30.6	October 11.....	33.0	36.8
.....	.....	October 20.....	43.6	October 22.....	29.9	October 18.....	20.9	October 18.....	20.8	28.8
.....	.....	October 27.....	35.6	.....	.....	October 25.....	18.9	October 25.....	27.7	23.3
.....	.....	.....	.....	.....	.....	November 1.....	7.4	November 1.....	22.9	15.1

SEEDING AT DIFFERENT DEPTHS.

For three seasons the Station has conducted experiments in wheat at different depths, varying from one to five inches. For the plots placed between one and one-half and four inches deep the difference in yield has been too slight to justify drawing any conclusions. The plot seeded five inches deep showed a noticeable falling off in the quantity of straw being proportionately more reduced than grain.

METHODS OF SEEDING.

Under this head we have different methods of seeding in connection with the methods of culture. The previous treatment of the seed was as nearly identical as was possible. The difference in method of seeding was produced simply by the use of various patent attachments, the ordinary Buckeye grain drill being used with the shoe attachment, the shoe followed by press wheels, one after each shoe; and the hoe followed by press wheels.

The *Lois Weedon* method consists primarily in allowing the ground to fallow each alternate year, and cultivating it so as to keep the weeds from growing.

The broadcast seeding was done by hand and harrowed in by a spike harrow at the same rate as the balance was drilled, viz.: five bushels per acre.

Velvet chaff wheat was used, and it was drilled about the first of September. The compacting of the soil was done by continuous harrowing with a wooden roller. The light mulch was put on from three to four inches thick, and the table gives evidence of its being injurious rather than beneficial. The mulch in the second plot was quite too heavy, from eight to ten inches thick. It resulted in an entire failure of a single head reaching maturity, and scarcely a sprout of wheat was seen to mark the place of the plot. The plots mulched were subjected to a western exposure, but sloped sufficiently to carry off all surface water. Table IX., which follows, will show the results:

Plat number.	Methods of seeding.	Yield of grain, per acre.	Weight of straw per acre.	Weight of straw to 100 lbs. of grain.	Lodged.
58.....	Lois Weedon culture.....	37.3	3968	177.1	Erect.
81.....	Shoe drill.....	45.3	4512	165.8	10 per cent.
82.....	Shoe drill, wheel press.....	50.6	4704	154.7	23 per cent.
83.....	Hoe drill, roller press.....	48.0	5056	175.5	38 per cent.
84.....	Broadcast, by hand.....	35.7	3872	180.5	43 per cent.
93.....	Light mulch, 3-4 inches.....	26.1	2272	144.9	Erect.
94.....	Heavy mulch, 8-10 inches.....	Failure.	Failure.	Failure.	Failure.

SUMMARY.

Varieties.—The Hungarian, Egyptian, Theiss, Tuscan Island and Nigger, among the red bearded wheats, are recommended of trial; of the smooth red wheats, the German Emperor, French Michigan Amber and Wyandotte Red; of white wheats, the Amber, Democrat and Silver Chaff (smooth.)

Quantity.—While the thick and thin seeding shows results to light seeding, we do not recommend for general practice less than seven pecks, nor more than seven.

Time of seeding.—South of the 41st parallel we believe wheat should be sowed after the 10th of September, but the northwestern will bear earlier sowing.

Depth of seeding.—So far as tested, the depth of seeding within reasonable limits does not affect the yield.

Winter protection.—The experiments made here in the way of winter protection do not justify us in even venturing an opinion until we have had a further trial.

Preparation.—Thorough preparation of the seed bed is one of the great essentials towards securing a good crop. Plow early, stir the soil thoroughly and often, make the surface smooth and level, so that the seed will not stand in low places, then put the wheat in when the soil is in good friable condition, not too wet, and nature will finish the crop without further aid.

II. EXPERIMENTS WITH OATS.

The work in oats for this season has followed pretty closely the plan of previous experiments, and will be classified under about the same. We have added to the list an experiment upon ground in which had been planted the year before, and to which commercial fertilizers had been added for the corn crop. The work, therefore, is comprised under the following divisions:

- I. COMPARATIVE TESTS OF VARIETIES.
 - (a). AT THE STATION.
 - (b). BY FARMERS.
 - II. DIFFERENT AMOUNTS OF SEED PER ACRE.
 - III. TESTING SECONDARY EFFECT OF COMMERCIAL FERTILIZERS.
-

I. COMPARATIVE TEST OF VARIETIES AT THE STATION.

The soil upon which the several varieties of oats grew in 1888 was different from that of previous years, being a change from what we call second bottom down to first bottom; the former being a moderately heavy clay loam, the latter an alluvial soil. From this land one crop of wheat had been taken, after two years of previous cropping with wheat. The ground was plowed April 8th to 12th, working eight inches deep. It was then rolled, then harrowed, and afterwards rolled again, then the several varieties of oats were drilled in at the rate of eight pecks per acre. The plots were each one-tenth acre in size, and were all the same shape, giving them the same general exposure. The seeding was done April 12th and

All made a very thrifty growth, but the soil proved to be so infested with *Convolvulus arvensis* that it was necessary to keep a hand among the oats, pulling out the bind-weed, for nearly two weeks. Even with this precaution the weeds prevented the perfect stand we might otherwise have had. The several plots stood nicely and gave evidence of a fine yield about the time that the grain was in the milk state, at which time a heavy rain with wind caused the entire crop to go down. But one variety raised again, namely, the Hopetown. We had two plots of this variety in different parts of the field, and both raised and stood up until they were ripe enough to cut. The other varieties raised somewhat, but not sufficiently to be cut with the cradle, and as a result all lodged very badly and nearly all made a second growth. The lodging rendered it necessary to cut the oats all one way, which was done suc-

cessfully with an Excelsior reaper. We succeeded in getting them gathered sufficiently clean to make the test satisfactory in that particular. In Table I will be found the comparative yield of the several varieties, as well as other matters of more or less importance.

OATS.—TABLE I.—COMPARATIVE TEST OF VARIETIES.

Plot No.	Variety.	Yield of grain per acre.	Weight of bus. of grain.	Weight of straw per acre.	Color of grain.	Date of ripen- ing.
		<i>Bus.</i>	<i>Lbs.</i>	<i>Lbs.</i>		
1	Badger Queen (Station)	30.0	38	2730	White.	July 17
2	Hargett's White (Station)	44.0	31	2710	White.	" 28
3	Henderson's Clydesdale.....	37.1	35	2350	White.	" 31
4	Clydesdale (Station)	32.2	35	2070	White.	" 30
5	White Schoenen (Station)	53.7	33	2670	White.	" 30
6	Welcome (Livingston)	32.8	35	2330	White.	" 28
7	Race Horse (Station).....	34.3	35	2460	White.	" 28
8	Early Prize Cluster (Station).....	36.5	34	2760	White.	" 28
9	White Victoria (Station)	37.5	33	2340	White.	" 28
10	Wideawake	55.6	29	2660	White.	" 28
11	Barley Oats (Station)	41.9	32	3040	White.	" 28
12	Race Horse (Vaughan).....	53.1	34	2370	White.	" 24
13	Badger Queen (Vaughan).....	32.5	35	2810	White.	" 21
14	Welch (Station)	47.0	28	2330	White.	" 30
15	State of North Dakota (Station).....	51.5	30	2970	White.	" 28
16	White Russian (Station).....	44.0	27	2590	White.	" 28
17	Hopetown (Station).....	50.9	31	2530	White.	" 28
18	Yankee Prolific (Station).....	52.5	27	2490	White.	" 28
19	Kansas Hybrid (Station)	52.5	31	2800	White.	" 28
20	Probsteier (Station).....	52.1	30	2850	White.	" 30
21	White Canada (Station)	40.6	30	2460	White.	" 30
22	Pringle's Progress (Vaughan).....	49.6	30	2240	.....	" 17
23	Monarch (Station)	47.8	32	3150	Mixed.	" 17
24	Rust Proof (Station).....	43.7	36	2800	Mixed.	" 17
25	Black Russian (Station).....	36.2	32	2300	Black.	" 28
26	Harris (Station)	28.4	24	2190	Mixed.	" 10
27	Black Tartarian (Station)	41.2	26	1880	Black.	" 30
28	Welcome (Maule).....	26.5	35	2310	White.	" 28
29	Welcome (Livingston)	25.9	35	2350	White.	" 28
30	Badger Queen (Livingston).....	23.1	38	2480	White.	" 21
31	Race Horse (Livingston)	29.0	34	2150	White.	" 28
32	Banner.....	48.7	31	2500	White.	" 30
33	Dakota Gray.....	49.3	26	2200	Black.	" 30
34	Early Dakota (Station).....	41.2	34	2460	White.	" 28
35	White California	43.7	28	2340	White.	" 28
36	Egyptian (Vaughan).....	40.0	29	1980	White.	" 28
37	Pringle's America Triumph.....	28.1	33	2060	White.	" 30
38	White Belgian (Station).....	51.2	30	1400	White.	" 30
39	Colonel Oats	50.0	29	2020	White.	" 30
40	Hopetown (Henderson).....	51.5	30	1910	White.	" 30
41	Japan Oats.....	45.0	30	2240	White.	" 30
42	Welcome (Station).....	28.1	35	2060	White.	" 30
43	Clydesdale (Station)	24.6	34	2150	White.	" 30
44	Welcome (Station).....	23.4	35	1890	White.	" 30
45	Clydesdale (Station).....	21.2	34	1740	White.	" 30

The above table furnishes evidence of an increased fertility in the from plot 1 up to plot 22; there is also some variation from No. 23 to 44. may be observed that both Clydesdale and Welcome, as found in Nos. 4 6, are higher in yield than they are in Nos. 42 to 45, inclusive. The very yield in Nos. 44 and 45 is the result of the damage done by the bind- d, which was not weeded from these two plots. There is a striking ilarity in yield of the Clydesdale and the Welcome throughout; the most interesting feature that the table presents is the very low d of both of these varieties that have usually been considered very ductive. They are, as may be observed, among the lowest in yield. y however still retain one redeeming quality, namely, their weight measured bushel. While not the highest, yet their weights are among highest. It is true the ground in this experiment was very different a that upon which they have been grown heretofore, but we have also t this season upon the same ground on which these oats were grown

OATS.—TABLE II.—COMPARATIVE YIELD OF VARIETIES FOR FIVE YEARS.

Variety.	Yield of grain per acre.						No. of years grown.
	1884.	1885.	1886.	1887.	1888.	Aver- age.	
	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Bus.</i>	
ican Triumph.....	60.0	34.5	37.3	.....	.....	43.9	3
Prize Cluster.....	.....	59.5	60.7	56.6	36.5	53.3	4
steier.....	.....	.....	70.3	50.8	52.1	57.7	3
ome.....	69.5	78.5	40.8	46.2	27.3	52.4	5
er Queen.....	.....	.....	75.7	50.8	27.3	51.2	3
y.....	.....	80.5	61.1	32.9	41.9	54.1	4
esdale.....	.....	78.0	66.1	40.9	26.3	52.8	4
Horse.....	.....	84.5	53.6	29.5	34.3	50.5	4
e Belgian.....	68.5	74.0	28.9	24.0	51.2	49.3	5
e Canadian.....	63.3	64.8	40.5	22.5	40.6	46.3	5
e German.....	65.3	80.2	44.3	26.9	.....	54.1	4
e Russian.....	59.3	55.0	47.8	40.7	44.0	49.3	5
e Russian Improved.....	.....	53.2	47.8	40.1	.....	47.0	3
ee Prolific.....	.....	68.5	49.0	57.9	52.5	56.9	4
Russian.....	.....	.....	85.2	50.9	36.2	57.4	3
Tartarian.....	.....	.....	63.0	57.9	41.2	54.0	3
nian.....	.....	51.2	46.5	32.2	.....	43.3	3
Dakota.....	.....	71.5	62.3	58.9	41.2	58.4	4
is.....	.....	.....	39.9	38.4	28.4	35.5	3
erson's Clydesdale.....	.....	.....	68.0	67.8	37.1	57.6	3
town.....	.....	.....	53.8	33.4	50.9	46.0	3
as Hybrid.....	.....	72.8	51.9	44.3	52.5	55.3	4
of North Dakota.....	.....	.....	51.2	49.2	51.5	50.6	3
h.....	56.7	65.5	39.7	41.3	47.0	50.0	5
e Schoenen.....	.....	82.8	52.4	50.3	53.7	59.8	4
e Victoria.....	.....	.....	57.2	36.7	37.5	43.8	3
rch.....	.....	76.0	45.0	60.9	47.8	57.4	4
Proof.....	57.3	73.5	35.3	68.8	43.7	55.7	5

last year, which throws some light upon the question of soil differences. This point will be referred to again in the discussion of the experiment designed to show the effect of growing oats after corn to which commercial manures had been applied.

In the average for a series of years the White Schoenen takes the lead, giving 59.8 bushels per acre. This oats was received from the New York Station in 1885. It is a moderately early oats, of fair growth, slender kernels of medium length, but variable in size.

The Black Russian, Early Dakota and Henderson's Clydesdale seem to stand about alike in point of yield; but the first mentioned has been more affected with rust than the other two. The Rust Proof oats held the lead in 1887, and may still be considered among the best. This variety is not, however, as the name would indicate, entirely free from rust. The three varieties above named seem to rank about the same in weight per measured bushel.

OATS.—TABLE III.—WEIGHTS OF VARIETIES FOR FIVE YEARS.

Variety.	Weight of measured bushel.						No. of years grown.
	1884.	1885.	1886.	1887.	1888.	Average.	
	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	<i>Lbs.</i>	
American Triumph.....	31.0	29.0	31.5	.....	.....	30.5	3
Early Prize Cluster.....	.....	37.0	37.0	37.0	34.0	36.2	4
Probsteier.....	.....	.....	31.5	30.0	30.0	30.5	3
Welcome.....	39.5	35.0	38.5	37.0	35.0	37.0	5
Badger Queen.....	.....	.....	39.5	38.0	38.0	38.5	3
Barley Oats.....	.....	37.0	38.5	35.0	31.0	35.4	4
Clydesdale.....	.....	38.5	39.0	36.0	35.0	37.1	4
Henderson's Clydesdale.....	.....	.....	39.0	38.5	35.0	37.5	3
Race Horse.....	.....	31.5	40.0	36.0	35.0	35.6	4
White Belgian.....	36.5	34.0	34.5	32.5	30.0	33.5	5
White Canadian.....	33.0	30.5	33.5	31.0	30.0	31.6	5
White German.....	32.0	30.5	32.0	31.5	.....	31.5	4
White Russian.....	31.0	31.0	32.5	32.0	27.0	31.3	5
White Russian Improved.....	.....	30.0	33.5	31.0	.....	31.5	3
Yankee Prolific.....	.....	31.0	32.5	32.5	27.0	30.7	4
Black Russian.....	.....	.....	31.5	31.5	32.0	31.6	3
Black Tartarian.....	.....	.....	31.5	28.0	26.0	28.5	3
Bohemian.....	.....	40.5	38.0	35.5	.....	38.0	3
Early Dakota.....	.....	31.5	31.0	30.5	34.0	31.7	4
Harris.....	.....	.....	26.5	24.5	24.0	25.0	3
Hopetown.....	.....	.....	34.0	29.0	30.0	31.0	3
Kansas Hybrid.....	.....	34.0	32.0	29.0	31.0	31.5	4
State of North Dakota.....	.....	.....	32.0	31.0	30.0	31.0	3
Welch.....	32.0	28.0	32.0	32.0	28.0	30.4	5
White Schoenen.....	.....	30.0	32.0	32.0	33.0	31.7	4
White Victoria.....	.....	.....	39.0	35.5	33.0	35.8	3
Monarch.....	.....	29.5	29.0	33.5	32.0	31.0	4
Rust Proof.....	30.0	29.0	29.0	29.0	36.0	30.6	5

Henderson's Clydesdale and the Clydesdale as grown from seed selected from other sources have many like characteristics, yet in yield they do not agree. Individual experiments and the average results for a series of years give the preference to Henderson's Clydesdale, over the ordinary Clydesdale oats.

The Harris oats has kept up its record as the lightest in weight and the lowest in average yield per acre. For early maturing it is in advance of all other varieties grown at the Station by at least two weeks. The grain is not only light, but the increased bulk indicated by its lightness makes it difficult to feed through a grain drill sufficiently fast to drill at the rate of two bushels per acre. When in the feed box of the drill it is about as that amount of bran would in the same place, and in order to make it feed it is necessary to force it by pressure from above; and yet, if I were seeding any amount of this variety I would sow it broadcast.

Upon the soil at the Experiment Station I have to decide the Harris oats a failure.

THE SMUT OF OATS.

This fungus growth has become a serious annoyance. Respecting the cause of its appearance and the influences that favor its development but little is known; but the fact that some varieties are more injured by it than others is undisputed. Among the varieties given in Table I, the Henderson's Clydesdale was probably as little affected as any; next to it may be mentioned the Hopetown. Those varieties affected the most are the Black Russian and Badger Queen.

TESTS OF VARIETIES BY FARMERS.

Owing to the changes that were being made at the Station about the middle of April, 1888, only a few varieties of oats were sent out for farm tests; but these few have been well reported upon, and the reports are of great value of a place in our report; hence, I shall give them substantially as they have been received.

Badger Queen.

W. R. Cowles, Geneva, Ashtabula County.—Soil, clay loam; planted to corn previous year; ground cultivated, not plowed; smut, 20 per cent.; some rust; "yield not over what my ordinary oats would make;" yield, 25.3 bushels per acre; straw, 3,000 pounds per acre; weight per measured bushel, 38.5 pounds.

Black Russian.

W. R. Cowles, Geneva, Ashtabula County.—Soil, clay loam; ground cultivated and plowed; smut, 45 per cent.; rust some; "the main trouble was the smut; by actual

count there was 45 per cent. smut;" yield per acre, 25.9 bushels; straw, 2464 pounds; weight per struck bushel, 30 pounds.

Jas. Rose, Haverhill, Scioto County.—Soil, clover sod, plowed, harrowed and rolled; sown April 22d; some azotized bone sown with it; bushels per acre, 19; weight per measured bushel, 36 pounds; no smut reported, and a very little rust; "am well pleased with these oats, and will try them again."

Black Tartarian.

C. S. Morris, Chardon, Geauga County.—Soil, clay and in corn the year previous; fall-plowed; yield, 52 bushels per acre; weight per measured bushel, 34.5 pounds; "I think they will yield better than any other oats in this section; no rust, no smut."

Henderson's Clydesdale.

N. B. Cowles, Geneva, Ashtabula County.—Clay soil, in corn previous season; cultivated, and put in with drill; "yield not quite as good as my White California in the same field;" yield per acre, 37.5 bushels; straw, 3424 pounds; weight per measured bushel, 39 pounds.

Clydesdale (Station seed).

Jas. Rose, Haverhill, Scioto County.—Soil, clover sod, plowed, harrowed and rolled; bone phosphate applied; smut 10 per cent., and badly rusted; "not as good as other varieties usually grown in this locality; very pretty oats, but do not think as much of them as I do the Barley oats;" yield, about 11 bushels per acre; weight, 34 pounds per measured bushel.

Clydesdale.

F. S. Morris, Chardon, Geauga County.—Soil, rather poor clay, in corn in 1887; fall plowed; seed sown April 27th with a broadcast seeder; no smut, no rust; yield about 45.9 bushels; "average yield of other oats raised here, about 40 bushels per acre;" weight of grain per measured bushel, 36.3 pounds.

Welcome.

Jas. Rose, Haverhill, Scioto County.—Soil, clover sod; plowed, harrowed, rolled and sown April 20th; rust considerable; yield about 13 bushels per acre; weight per bushel, 33 pounds.

J. H. Bennett, Champaign County.—Black bottom land, was in corn year before; ground harrowed without plowing; rolled and harrowed in seed; sown broadcast; 15 per cent. smut; very little rust; yield per acre, 56 bushels; weight of measured bushel, 37 pounds.

F. S. Morris, Chardon, Geauga County.—Clay soil, in corn in 1887; a light dressing of yard manure; fall plowed; sown with a broadcast seeder; "the Welcome oats do not yield well in this section;" yield per acre, 28.3 bushels; weight of measured bushel, 39.25 pounds.

N. B. Cowles, Geneva, Ashtabula County.—Soil, clay loam; cropped with corn last season; ground cultivated and harrowed, and planted with a drill April 28th; "some smut and some rust;" yield per acre, 32.3 bushels; straw per acre, 2748 pounds; weight of measured bushel, 38 pounds.

The above tests are all valuable in themselves, but it does not seem practicable to make any general comparison of the same varieties, because

of the varying conditions under which they were grown. For instance, we find one man plowing in the fall, another in the spring, and a third does not plow at all, but simply harrows his corn stubble of the year before, while a fourth may use two or three hundred pounds of commercial manures. These variations in preparation prevent any methodical comparison of results. We hope this coming season to establish a uniform method among those who make these variety tests; then the results can be better compared, and the study of varieties and the soils to which they are best adapted can be more methodically conducted.

II. THICK AND THIN SEEDING.

This experiment was made upon the second bottom, or upland, which is quite different from the soil upon which the variety test was made. The same field and the same kind of soil were used in this experiment as in the one on which the experiment next to be reported was made. The ground was thoroughly plowed the second week in April, well harrowed, and the oats drilled at the rate per acre designated for the several plots in Table IV. We had in this series twenty-six plots, every test having one or more duplicates, and Table IV gives the average in each case of two or more plots that were treated exactly alike. The amount of increase in yield is gradual, from the two-peck rate up to six pecks per acre; the seven and eight-peck plots fall but slightly below the highest, but the turn from greater to less yield begins properly at the six-peck rate. This is not quite

OATS.—TABLE IV.—THICK AND THIN SEEDING.

No. of plot.	Seed.	Yield.	Straw.	Weight of grain per bushel.
	Pecks per acre.	Bushels per acre.	Pounds per acre.	
				<i>Pounds.</i>
1	2	52.7	2525	36
2	3	55.4	2355	36
3	4	57.7	2570	36
4	5	60.3	2960	36
5	6	63.5	3060	35
6	7	54.8	3055	34
7	8	49.6	3275	34
8	9	44.8	3225	34
9	10	44.9	3290	30
10	11	45.2	3370	30
11	14	33.4	2960	28
12	16	34.1	3370	28

in accord with the results of last year's experiment, which favored the plot sown at the rate of eight pecks per acre. The variety of oats grown was the Clydesdale. The plot sown at the rate of sixteen pecks per acre gave a large product in bulk, but the weight per measured bushel was only 28 pounds, while where the rate of seeding was three and four pecks per acre, the weight per bushel reached 36 pounds; a difference of eight pounds per bushel between the three and four-peck rate and the sixteen-peck rate. The weight of straw is also quite variable.

III. EFFECT UPON OATS OF COMMERCIAL MANURES APPLIED TO THE PREVIOUS CROP.

The question is often asked, does the effect of fertilizers extend beyond the first crop? If so, in what way and to what extent? The question is one of considerable importance, not only to the practical farmer, but also to the experimenter, whose results may or may not be vitiated from the effects of previous applications of commercial manures. If these manures more benefit the second and third years after application than they are during the first season, then we often practice false economy when we buy them for our wheat ground in the fall, after having applied them to the same ground for corn in the spring. If, on the other hand, they do not show any results on the second or third crop after they have been applied, then we may be assured that it is necessary to get a sufficient increase in yield in the first crop after application to pay for the cost of the fertilizer and its application.

The spot selected for this experiment was one on which corn had been grown for several successive seasons, with various kinds and combinations of fertilizers, and without any manure whatever. The result was that the plots which had received no fertilizer for a period of one to four years gave as high an average yield of oats as those which had received an annual dressing of fertilizers of various kinds, and in various quantities, from 600 pounds of a highly nitrogenous fertilizer down to 200 or 300 pounds of phosphates and potash salts without nitrogen.

The variety of oats used in this test was the Welcome, and the average yield per acre was about forty bushels. Attention is here called to the point previously referred to, namely, the difference in yield on low ground and higher ground. It is true the bind-weed may have had something to do with the lower yield from the low ground, but it would seem that the clay loam is the better adapted to oats, and especially to the Clydesdale or Welcome oats. An average of eight bushels more to the acre is at least sufficient cause for raising the question, do Welcome and Clydesdale oats

yield as well when grown upon low, moist land, as they do when grown upon land higher and dryer?

SYNONYMS.

By grouping together those varieties in the foregoing list which offer no points of distinction to the botanist, the list might be very materially reduced. Such grouping would not be satisfactory to the farmer, however, as there are other distinguishing features in the so-called varieties of the cereals, which are of far more importance to him than botanical differences, such as weight of grain per bushel, and tendency to disease. These features, therefore, have received more attention in our work than classification and the determination of synonyms, although it is hoped that there may be found opportunity for that work also in the future.

SUMMARY.

1. In the comparative test of 1888 the following varieties show the largest yields: White Schoenen, Race Horse, State of North Dakota, Hopetown, Yankee Prolific, Kansas Hybrid, and Probsteyer. These varieties have each yielded about fifty bushels per acre.

2. The variety most affected by smut was the Black Russian, but out of the forty or more varieties none were entirely free from smut.

3. The varieties weighing most to the measured bushel were Badger Queen, Rust Proof, Welcome, Early Dakota, Clydesdale and Race Horse.

4. The variety with strongest straw, Hopetown. This was the only variety that raised up after the rain and wind storm in July.

5. There is a continuous variation between the results from Clydesdale seed received from Henderson and the seed of the same name received from other sources, Henderson's Clydesdale having a continued advantage.

6. In a series of experiments continuing over four and five years, the following varieties show the largest average yields: White Schoenen, Monarch, Rust Proof, Barley, White German, Yankee Prolific, Early Dakota, and Kansas Hybrid.

7. A variety of oats called Harris, distributed by the Department of Agriculture in the spring of 1886, after a three years' trial is pronounced a failure on the soil of the Station.

8. From seeding at the rate of six pecks per acre, a larger yield was obtained in 1888 than from heavier or lighter seeding; heavier oats per measured bushel were obtained where less seed was sown per acre, and lighter oats where more seed was sown per acre.

9. Commercial manures applied to the previous corn crop, but not to the oats, produced no noticeable effect in the crop of oats sown on the corn stubble.

EXPERIMENTS WITH CORN.

The experiments with corn will be treated under the following general headings:

- I. COMPARATIVE TEST OF VARIETIES.
- II. PLANTING AT DIFFERENT DEPTHS AND AT DIFFERENT TIMES.
- III. DISTRIBUTION OF SEED.
- IV. TEST OF SEED FROM DIFFERENT PARTS OF THE EAR.
- V. DIFFERENT AMOUNTS OF CULTIVATION.
- VI. DIFFERENT MODES OF CULTIVATION.
- VII. TESTS WITH COMMERCIAL FERTILIZERS.

INTRODUCTION.

No cultivated crop grown in the State of Ohio is of more importance to her agricultural population than the cereal we designate as corn. Few crops grown by the farmer are raised under conditions and variations so wide in their range, and the experimenter soon discovers that there are many obstacles to be overcome and many details to be looked after in order to obtain reliable results, which had possibly not occurred to him at the outset. Every man who has grown this crop has discovered sooner or later that it requires something more than seed and soil to produce a crop of corn. It demands constant attention and care from the time it is placed in the soil until it has gotten beyond the point where the weeds are liable to overtake and retard its growth. It is not only subject to destruction by the growth of other vegetation about it, but is also liable to the ravages of numerous insects. These pests seem to be upon the increase, almost every year bringing with it some new enemy to prey upon our corn crop.

The first questions that the amateur farmer asks are: "What variety of corn shall I plant?" "When shall I plant it?" "How deep shall I plant it?" and "With what shall I fertilize the soil?" These questions are asked not only by the beginners, but also by those who have spent their lives in the fields of agriculture. These were the questions which the average farmer of by-gone years did not need to ask, because the virgin soil produced the crop in spite of the most careless husbandry, and without the use of manures or fertilizers, while insect enemies were scarcely if ever thought of until within a score of years. The seasons were also more regular. The spring-time did not extend into midsummer,

nor the fall begin where spring left off. But since the seasons demand more careful study, the soil more skillful preparation, and the possibility of insect ravages more attention, we are compelled to investigate these problems and to discover, if possible, some method of escaping or overcoming the serious difficulties with which we find ourselves confronted. Hence the first line of investigation upon which the Station originally entered, and which we have continued during the past year, is the problems referred to, namely, what variety shall we plant, when shall we plant, and how deep shall we plant, in order that we may secure the most profitable results.

I. COMPARATIVE TEST OF VARIETIES.

The variety tests were made this year on river-bottom soil, which had been cropped the year previous with corn and beets. On account of heavy rains the ground was not plowed until about the 10th of May. It was then plowed, harrowed and planted as rapidly as possible, so that by the 15th of May the corn was all planted. The ground was plowed about eight inches deep, then thoroughly harrowed and prepared in fine condition for receiving the seed corn, which was planted with a two-horse planter. These several varieties were planted within two days. The ground did not receive any manure nor fertilizer, the natural fertility of the soil being such as to warrant the expectation of a fair yield without the application of manure.

The following named varieties were grown this year, the classification being the same as that of last year, and the name in parenthesis being that of the seedsman from whom seed was obtained, except when the seed was grown by the Station:

Large Yellow Dent.

- | | |
|--------------------------------------|---------------------------------------|
| 1. Chester Co. Mammoth (Maule). | 7. Murdock (University of Ill.) |
| 2. Chester Co. Mammoth (Vaughan). | 8. Golden Beauty (Johnston & Stokes). |
| 3. Cloud's Early (Johnson & Stokes). | 9. Golden Beauty (U. S.) |
| 4. Golden Beauty (Maule). | 10. Golden Beauty (Henderson). |
| 5. Imp. Leaming (Johnson & Stokes). | 11. Leaming (Vaughan). |
| 6. Improved Leaming (Salzer). | |

Medium Yellow Dent.

- | | |
|------------------------------------|---------------------------------------|
| 12. Briar Crest Beauty (Maule). | 20. Mason's Yellow (Vaughan). |
| 13. Clarage (Station). | 21. Prize (Salzer). |
| 14. Clarage (Livingston). | 22. Pride of the North (Salzer). |
| 15. Edmund's Premium (Vaughan). | 23. Queen of the Prairie (Henderson). |
| 16. Edmund's Premium (Leonard). | 24. Rhode Island Cap (Thorburn). |
| 17. Farmer's Favorite (Henderson). | 25. Scott's Yellow Dent (Scott). |
| 18. Illinois Premium (Vaughan). | 26. S. F. (Leonard). |
| 19. Leaming Gourd Seed (Station). | |

Small Yellow Dent.

- | | | |
|--------------------------------------|--|-----------------------------------|
| 27. Arlens (Wilson). | \| | 29. Pride of the North (Vaughan). |
| 28. Pride of the North (Livingston). | \| |  |

Large White Dent.

- | | | |
|---|--|--|
| 30. Blount's Prolific (Wilson). | \| | 34. Parish (Vaughan). |
| 31. Champion White Premium (Eyeritt). | \| | 35. Ward's White (W. Dresbach). |
| 32. Hess' White (Station). | \| | 36. White Giant Normandy (U. S. Navy). |
| 33. L'ge White Flint (Johnston & Stokes.) | \| |  |

Medium White Dent.

- | | | |
|------------------------------|--|--------------------------------|
| 37. Early Dawn (Livingston). | \| | 40. Old Cabin Home (Landreth). |
| 38. Hiawassie (Faust). | \| | 41. Virginia White (———). |
| 39. Hickory King (———). | \| | 42. White Surprise (Dreer). |

Yellow Flint.

- | | | |
|---|--|-------------------------------------|
| 43. Chadwick (Vaughan). | \| | 48. Golden Yellow Flint (Thorburn). |
| 44. Angel of Midnight (Breck & Sons). | \| | 49. Hudson Bay (Landreth). |
| 45. Angel of Midnight (Vaughan). | \| | 50. Large Yellow (Thorburn). |
| 46. Early Yellow Canada (Johnson & Stokes.) | \| | 51. Pennsylvania Flint (———). |
| 47. Golden Dew-Drop (Henderson). | \| | 52. Top Over (Vaughan). |
|  | \| | 53. Top Over (Thorburn). |

Large White Flint.

- | | | |
|-----------------------------------|--|-----------------------------|
| 54. Large White Flint (Dreer). | \| | 56. Silver White (Vaughan). |
| 55. Large White Flint (Thorburn). | \| | 57. Tuscarora (Landreth). |

Mixed (or Red) Flint.

- | | | |
|-----------------------------------|--|--------------------------|
| 58. King Philip (Vaughan). | \| | 60. Smut Nose (Vaughan). |
| 59. New Self-Husking (Henderson). | \| |  |

Soft or Flour.

- | | | |
|---------------------------|--|--------------------------------|
| White Flour Corn (Maule). | \| | Podded Corn (Joseph Clements). |
|---------------------------|--|--------------------------------|

Ensilage Corn.

- | | | |
|-----------------------------------|--|-----------------------------------|
| Blount's White Prolific (Sibley). | \| | Southern Horse Tooth (Henderson). |
| Sheep Tooth (Sibley). | \| | Southern White Ensilage (Leon). |

The podded corn does not properly belong under the head of Flour Corn. It is certainly distinct in itself. It is called podded because each grain has a separate husk or covering.

The several varieties listed under ensilage corn were only the varieties grown here for that use. A full account of these and their product will be given on a separate bulletin.

YIELD OF VARIETIES.

The comparative test of varieties of corn is one of the most experiments with which the experimenter has to deal, there

so many things to be considered, and so many points that we cannot control. Among these may be mentioned the different periods of pollination among the several varieties. The pollination is, of course, imperfect if several varieties maturing at widely different periods be planted near together in small plots or single rows; but if varieties maturing at nearly the same time be planted near together, the extension of the period of pollination may give those maturing at medium dates a decided advantage over the earliest and latest of the group.

The weather following the cutting season may differently affect corn ripening at different dates. To illustrate, if a variety maturing late in August be cut just previous to a fortnight of good, drying weather, and another variety maturing about the middle of September be cut just previous to wet weather, we should find that the two varieties husked two weeks later could not be justly compared. Hence, unless varieties maturing at different dates show wide divergence in yield, no definite conclusions can be drawn from a single test.

Owing to excessive rains in September and October, the corn had no opportunity to dry out to good condition for cribbing, and therefore 100 pounds of each variety was placed in a barrel and its weight taken again January 15th, when it was shelled and the weight of shelled corn and cobs determined. Table I gives the data obtained from this part of the experiment, and Table II gives the yield of grain and fodder per acre, as weighed from the field, but corrected to full stand; the yield of dry corn, as calculated from the data furnished by Table I; the date of cutting, number of days between planting and cutting, and the state of maturity of the corn when cut.

In Table II, and several of the subsequent tables, the yield of grain is reported in two columns; the first being the actual rate of yield as weighed from the field, the second being the yield that would have been obtained had every hill contained three stalks, and each stalk produced an ear equal in weight to the average of those actually produced. The possible, or corrected yield, is therefore the better criterion of the true results of the experiment.

CORN.—TABLE I.—SHRINKAGE IN DRYING—PERCENTAGE OF SHELLING
COB—COLOR OF COB.

Plot No.	Variety.	Weight when husked.	Weight Jan'y 15.	Shrinkage.	Weight of dry shelled corn.	Per cent. of cob in dry corn.	Weight per bushel
<i>Large Yellow Dent.</i>							
1	Chester County Mammoth	100	76	24	67	11.8	4
2	Chester County Mammoth	100	75	25	63	16.0	5
3	Cloud's Early	100	72	28	59	18.0	4
4	Golden Beauty	100					
5	Improved Leaming	100	88	12	72	16.0	5
6	Improved Leaming	100	88	12	73	17.0	5
7	Murdock	100	87	13	70	19.0	5
8	Golden Beauty	100	80	20	63	21.0	5
9	Golden Beauty	100	81	19	63	22.0	5
10	Golden Beauty	100	82	18	64	21.9	5
11	Leaming	100	82	18	66	19.5	1
<i>Medium Yellow Dent.</i>							
12	Briar Crest Beauty	100	76	24	57	25.0	1
13	Clarage	100	84	16	70	16.6	5
14	Clarage	100	83	17	70	15.6	5
15	Edmund's Premium	100	85	15	71	16.4	5
16	Edmund's Premium	100	93	7	79	15.0	1
17	Farmer's Favorite	100	64	36	46	28.0	5
18	Illinois Premium	100	80	20	63	21.0	5
19	Leaming Gourd Seed	100	82	18	69	15.8	5
20	Mason's Yellow	100	78	22	71		
21	Prize	100	80	20	58	22.5	1
22	Pride of the North	100	78	22	62	20.5	1
23	Queen of the Prairie	100	90	10	72	20.0	1
24	Rhode Island Cap	100	88	12	70	20.4	1
25	Scott's Yellow Dent	100	84	16	70	16.6	5
26	S. F. Leonard	100	95	5	80	15.7	5
<i>Small Yellow Dent.</i>							
27	Arlens	100	91	9	73	19.7	5
28	Pride of the North	100	82	18	66	19.5	5
29	Pride of the North	100	95	5	82	13.6	5
<i>Large White Dent.</i>							
30	Blount's Prolific	100	74	26	62	16.0	5
31	Champion White Premium	100	73	27	60	17.8	4
32	Hess' White	100	91	9	75	17.5	5
33	Large White Flint	100	80	20	68	15.0	5
34	Parish	100	72	28	60	16.6	5
35	Ward's White	100	80	20	61	23.7	1
36	White Giant Normandy	100	76	24	58	23.6	4
<i>Medium White Dent.</i>							
37	Early Dawn	100	87	13	70	18.0	5
38	Hiawassie	100	60	40	34	43.0	5

CORN.—TABLE I.—Concluded.

Variety.	Weight when husked.	Weight Jan'y 15.	Shrinkage.	Weight of dry shelled corn.	Per cent. of cob in dry corn.	Weight per bushel of dry corn.	Color of cob.
Hickory King.....	100	61	39	47	23.0	58.0	White.
Old Cabin Home.....	100	63	37	51	19.0	.....	White.
Virginia White.....	100	93	7	78	16.0	54.0	White.
White Surprise.....	100	62	38	46	25.8	56.0	White.
<i>Yellow Flint.</i>							
Chadwick.....	100	.....	.....	.....	.....	.....	.....
Angel of Midnight.....	100	80	20	64	20.0	58.0	White.
Angel of Midnight.....	100	87	13	72	17.0	58.0	White.
Early Yellow Canada.....	100	83	17	69	16.8	58.0	White.
Golden Dew-Drop.....	100	90	10	73	18.8	56.0	White.
Golden Yellow Flint.....	100	.....	.....	.....	.....	.....	.....
Hudson Bay.....	100	70	30	40	42.8	40.0	White.
Large Yellow.....	100	82	18	64	21.9	48.0	White.
Pennsylvania Flint.....	100	83	17	64	21.6	50.0	White.
Top Over.....	100	90	10	72	20.0	50.0	Red.
Top Over.....	100	82	18	65	20.7	56.0	White.
<i>Large White Flint.</i>							
Large White Flint.....	100	83	17	47	43.0	46.0	White.
Large White Flint.....	100	55	45	38	30.9	52.0	White.
Silver White.....	100	88	12	74	15.9	54.0	White.
Tuscarora.....	100	80	20	62	22.5	.....	Red.
<i>Mixed (or Red) Flint.</i>							
King Philip.....	100	76	24	65	14.0	52.0	White.
New Self-Husking ..	100	84	16	70	16.6	56.0	White.
Smut Nose.....	100	.....	.....	.....	.....	.....	.....
<i>Flour Corn.</i>							
White Flour Corn.....	100	50	50	38	24.0	40.0	White.

CORN.—TABLE II.—VARIETIES.

Yield per acre of grain and fodder, corrected to full stand.

No. of plot.	Variety.	Grain.		Fodder, lbs per acre.	Date of cutting.	Days from planting to
		Bu. of 70 lbs. as harvested.	Bu. of shelled corn Jan. 15.			
Large Yellow Dent.						
1	Chester Co. Mammoth.....	84.5	.....	1000	Sept. 26	12
2	Chester Co. Mammoth.....	110.5	81.0	1090	" 26	12
3	Cloud's Early.....	98.0	70.5	2460	" 26	12
4	Golden Beauty.....	75.4	.....	3800	" 29	12
5	Improved Leaming.....	79.4	71.5	2000	" 24	12
6	Improved Leaming.....	90.5	82.5	3000	" 17	12
7	Murdock.....	77.0	67.3	1800	" 21	12
8	Golden Beauty.....	91.1	71.7	4100	" 29	12
9	Golden Beauty.....	94.8	74.6	3950	" 29	12
10	Golden Beauty.....	89.4	71.5	3600	" 26	12
11	Leaming.....	67.1	55.3	1150	" 26	12
Medium Yellow Dent.						
12	Briar Crest Beauty.....	42.8	30.5	650	Aug. 28	9
13	Clarage.....	100.2	87.6	2100	Sept. 21	12
14	Clarage.....	82.5	72.2	1240	" 21	12
15	Edmund's Premium.....	66.0	58.5	1700	" 26	12
16	Edmunds' Premium.....	62.5	61.7	1600	" 26	12
17	Farmer's Favorite.....	87.7	50.4	4580	" 26	12
18	Illinois Premium.....	81.8	64.4	2100	" 26	12
19	Leaming Gourd Seed.....	67.1	57.8	2790	" 21	12
20	Mason's Yellow.....	42.8	38.0	1120	" 24	12
21	Prize.....	.....	.....	.....	.....	.....
22	Pride of the North.....	55.8	43.2	1400	Sept. 21	12
23	Queen of the Prairie.....	57.7	52.0	1680	" 26	12
24	Rhode Island Cap.....	71.1	62.2	1220	" 20	12
25	Scott's Yellow Dent.....	79.2	69.3	5400	" 26	12
26	S. F. Leonard.....	79.4	74.4	1640	" 15	12
Small Yellow Dent.						
27	Arlens.....	88.0	80.3	2800	" 26	12
28	Pride of the North.....	54.0	44.5	1100	" 8	10
29	Pride of the North.....	55.4	56.7	900	" 8	10
Large White Dent.						
30	Blount's Prolific.....	70.3	54.5	4600	" 29	12
31	Champion White Premium.....	20.0	15.0	.....	" 21	12
32	Hess' White.....	82.8	77.9	2400	" 22	12
33	Large White Flint.....	56.5	48.0	880	" 14	12
34	Parish.....	126.0	92.7	2800	" 26	12
35	Ward's White.....	88.5	67.4	3400	" 29	12
36	White Giant Normandy.....	57.8	41.9	2540	" 26	12
Medium White Dent.						
37	Early Dawn.....	62.5	54.6	2220	Aug. 25	9
38	Hiawassie.....	84.0	35.5	4200	Sept. 26	12

CORN.—TABLE II.—Concluded.

No. of plot.	Variety.	Grain.		Fodder, lbs. per acre.	Date of cutting.	Days from planting to cutting.	State of maturity.
		Bu. of 70 lbs. as harvested.	Bu. of shelled corn Jan. 15.				
	<i>Medium White Dent—Concluded.</i>						
39	Hickory King.....	72.0	42.3	3500	Sept. 28	128	Unripe.
40	Old Cabin Home.....	71.1	45.3	3900	" 21	121	Ripe.
41	Virginia White.....	70.2	68.4	1740	" 21	121	"
42	White Surprise.....	101.2	58.2	4600	" 29	129	Unripe.
	<i>Yellow Flint.</i>						
43	Ohadwick.....	6.2	.....	.....	Aug. 14	93	Ripe.
44	Angel of Midnight.....	46.8	37.4	680	" 24	93	"
45	Angel of Midnight.....	61.7	53.7	1020	" 24	93	"
46	Early Yellow Canada.....	64.0	55.2	1410	Sept. 15	115	"
47	Golden Dew-Drop.....	49.1	44.8	2180	" 4	104	"
48	Golden Yellow Flint.....	.....	.....	.....	.....	.....	.....
49	Hudson Bay.....	23.7	11.8	900	Aug. 26	95	Ripe.
50	Large Yellow.....	56.5	45.2	750	Sept. 21	121	"
51	Pennsylvania Flint.....	64.8	51.8	2300	" 26	126	Unripe.
52	Top Over.....	36.0	32.4	700	Aug. 24	93	Ripe.
53	Top Over.....	33.7	27.3	1200	" 24	93	"
	<i>Large White Flint.</i>						
54	Large White Flint.....	77.4	45.4	4000	Sept. 26	126	Unripe.
55	Large White Flint.....	87.4	41.5	3800	" 26	126	"
56	Silver White.....	59.1	54.6	700	" 21	121	Ripe.
57	Tuscarora.....	64.2	49.7	1110	" 17	117	"
	<i>Mixed (or Red) Flint.</i>						
58	King Philip.....	28.0	22.7	.....	" 1	101	Ripe.
59	New Self-Husking.....	29.4	25.7	1000	" 24	124	"
60	Smut Nose.....	35.4	.....	.....	Aug. 25	94	"
	<i>Flour Corn.</i>						
61	White Flour Corn.....	54.5	25.9	2020	Sept. 21	121	"

CORN.—TABLE III.—AVERAGES OF TABLES I AND II BY CLASS

Class.	No. of varieties.	Grain.				
		Bu. of 70 lbs. as harvested.	Per cent. of shrinkage.	Bu. of shelled corn Jan. 16.	Wt. of shelled corn per bu.	Per cent. cobs in dry corn.
Large Yellow Dent.....	11	87.0	19.0	71.8	50.5	17.5
Medium Yellow Dent.....	15	69.7	17.5	59.1	53.2	17.7
Small Yellow Dent.....	3	65.8	10.2	60.5	52.2	17.5
Large White Dent.....	7	71.7	22.0	56.8	50.0	18.6
Medium White Dent.....	6	76.8	29.0	50.7	55.2	23.2
Yellow Flint.....	11	44.2	17.0	39.9	53.0	21.8
Large White Flint.....	4	72.0	23.5	47.8	50.7	27.7
Mixed Flint	3	30.9	20.0	24.2	54.0	15.6
Flour Corn.....	1	54.5	50.0	25.9	40.0	24.0

In Table III the results shown in Tables I and II are as classes. It will be seen from this table that the largest yield was obtained from the Large Yellow Dent class, the Medium Yellow Dent following; next, the Large White Dent; next, White Flint, then the Yellow Flint, Flour Corn and Mixed Flint in order named. In the weight of shelled corn per bushel all the classes are below the standard of 56 pounds, the nearest approach to the standard being made by the Medium White Dent. In percentage of total weight of dry corn, the Yellow Dent varieties show a decided superiority over the White Dents, as well as over all the other varieties, except the Mixed Flint.

In conclusion, we must repeat, respecting this comparison of results, what has already been several times alluded to, namely, that the peculiarity of the season has so obscured the results that the conclusions apparently indicated must be accepted with a very large degree of caution. It may be asked, "Why publish results that are so liable to misinterpretation?" The reply is that the publication is made in the hope that the evident failure of this experiment may serve to impress upon our experimenters the necessity of exercising greater care in securing uniformity and thoroughly dry condition of their crops before entering upon a comparison of results. The failure of our attempt to secure such conditions in drying samples in barrels has demonstrated the necessity of a more thorough method; and, hereafter, it is proposed to dry the samples in rat-proof boxes made of wire netting, which shall be so arranged that the air may have free access to and through them, and so

It may be conveniently taken from time to time, until a stationary weight indicates that the process of drying is completed.

We believe, however, that the failure of this experiment may be due to success, if it shall draw the attention of farmers who have corn to sell, or who must buy, to the question of the shrinkage of corn in drying. This experiment shows that corn that was dry enough in October to be safely cribbed, yet lost ten to thirty or more per cent. in weight by February 15, and still was not in all cases thoroughly dry.

PLANTING AT DIFFERENT DEPTHS AND AT DIFFERENT DATES.

The ground used for this experiment is a rich alluvial soil that had been in corn the previous year. It was plowed on April 26, about eight inches deep, having been thoroughly covered with manure from the barn-heap before being plowed. It was all harrowed and thoroughly prepared in every particular upon the date of the first planting, and at each subsequent planting the ground used was fully harrowed and marked, and the planting done by hand. During the growing season variations in soil moisture and size were so marked that a stranger to the place would readily recognize the various stages of growth resulting from the difference in the date of planting. These variations were characteristic throughout the season.

The plots that were planted first were first to ripen. All had been cut and were fully matured at the date of harvesting, with the exception of the plot planted on June 5, which was not ripe when cut, but had been kept cut to keep it out of the way of frost.

—TABLE IV.—RESULTS OF PLANTING AT DIFFERENT DEPTHS AND ON DIFFERENT DATES.—YIELD OF SHELLED CORN PER ACRE, CORRECTED TO FULL GROWTH AND MATURED.

Depth of planting.	Date of Planting.					Average for all dates.
	April 26.	May 5.	May 15.	May 25.	June 5.	
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
2 inches.....	84.57	98.28	111.44	97.14	89.71	96.23
4 inches.....	92.57	93.71	94.28	93.14	91.43	93.03
6 inches.....	106.30	96.00	94.85	102.85	.....	99.40
8 inches.....	100.00	105.14	102.85	97.14	.....	101.00
Average.....	96.00	98.28	100.85	97.57	.....	.....

This corn was really very green and heavy, and especially the seed had been planted three and four inches deep. This is the high rate of yield from the plot planted on July 5, and the rows planted three and four inches deep.

By referring to Table IV we find that on the plot planted deep the yield increased from the first planting, on April 2, to the third planting, on May 15, but that the two succeeding plantings decreased. A partial explanation of this difference may be the fact that the one inch planting of April 26 came through the season more quickly than the deeper planting, and was injured by a light frost, while the latter escaped. The differences shown in the plantings made two inches deep are not large enough to justify the assumption that they are due to differences of treatment. Where the plantings were three and four inches deep we have a decrease in yield up to May 15, and an increase in the two later plantings. For the high product of the first planting and the gradual decrease up to May 15, I have no explanation. The increase in the two succeeding plantings can be accounted for by the fact that the corn did not dry out thoroughly. What has happened in the three-inch planting will apply largely to that which was planted four inches deep.

In Table V it will be observed that the number of stalks per bushel of dried pounds of corn runs nearly uniform, with the exception of the plot planted three and four inches deep on June 5; this is accounted for by the fact that the corn and fodder never dried out, and for this reason it has been deemed best to omit the yields of grain from both the three-inch and the four-inch plantings on June 5, because it was found that the weights obtained were largely due to excess of water.

CORN.—TABLE V.—RESULTS OF PLANTING AT DIFFERENT DEPTHS AND ON DIFFERENT DATES.

Yields of stalks per acre.—Ratio of $\frac{\text{stalks}}{\text{grain}}$ to grain.—Date of ripening.

Depth of planting.	Yields of stalks per acre, corrected to full stand.					Number stalks to 100 lbs. grain.					Date of ripening.				
	Date of planting.					Date of planting.					Date of planting.				
	April 26.	May 5.	May 15.	May 25.	June 5.	April 26.	May 5.	May 15.	May 25.	June 5.	April 26.	May 5.	May 15.	May 25.	June 5.
1 inch	Lbs. 3,880	Lbs. 4,400	Lbs. 8,590	Lbs. 6,395	Lbs. 8,136	Lbs. 142	Lbs. 130	Lbs. 128	Lbs. 147	Lbs. 159	Sept. 4	Sept. 10	Sept. 15	Sept. 21	Sept. 28
2 inches.....	4,453	5,744	4,641	7,450	7,868	154	153	149	147	156	Sept. 4	Sept. 10	Sept. 15	Sept. 21	Sept. 28
3 inches.....	4,000	4,721	5,976	8,346	6,772	154	146	150	137	97	Sept. 4	Sept. 14	Sept. 15	Sept. 21	Sept. 28
4 inches.....	4,400	6,294	5,149	6,872	8,675	139	131	136	147	56	Sept. 4	Sept. 14	Sept. 15	Sept. 21	Sept. 28
All depths.....	4,183	5,289	6,089	7,266	7,863	147	140	141	144						

CORN.—TABLE VI.—AVERAGE YIELD OF GRAIN FROM PLANTING AT DIFFERENT DATES, PLANTED ONE TO THREE INCHES DEEP.

Year.	Planted in April.		Pl't'd May 1-7.		Pl't'd May 8-15.		Pl't'd May 16-23.		Pl't'd May 24-31.		Pl't'd June 1-17.		Pl't'd June 8-15.	
	Date.	Yield.	Date.	Yield.	Date.	Yield.	Date.	Yield.	Date.	Yield.	Date.	Yield.	Date.	Yield.
1883.....		<i>Bus.</i>		<i>Bus.</i>		<i>Bus.</i>		<i>Bus.</i>		<i>Bus.</i>		<i>Bus.</i>		<i>Bus.</i>
1884.....														
1885.....	April 28	62.4	May 5	55.0	May 13	82.5	May 22	44.1	May 26	67.8	June 2	67.4	June 9	62.6
1886.....	April 28	44.3	May 6	44.1					May 29	36.5	June 5	35.4		
1887.....	April 26	47.4	May 4	42.8	May 14	34.1	May 24	35.0					June 14	27.0
1888.....	April 26	94.5	May 5	96.0	May 15	100.2			May 25	97.7	June 5	60.4		

DATE OF PLANTING.

Table VI exhibits the results of planting at different dates, one to three inches deep, over a period of six years. It will be noted that in different seasons the results may be opposite, owing to the variableness of our climate. In general, the extremely early and extremely late plantings have not done so well as those of the medium period, but this medium period extends throughout the month of May, or nearly so. The fact is that the temperature of the soil, the rainfall, etc., must determine the date of planting, and these vary so greatly in different seasons that it would be absurd to attempt to establish any fixed date.

DEPTH OF PLANTING.

CORN.—TABLE VII.—YIELD OF GRAIN FROM PLANTING AT DIFFERENT DEPTHS.

Average of all Dates.

Year.	One inch.	Two inches.	Three inches.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
1883.....	86.3	60.8	50.7
1884.....	36.9	37.4	41.6
1885.....	72.5	64.8	62.5
1886.....	58.9	41.3	32.3
1887.....	33.7	32.9	28.1
1888.....	96.2	93.0	.....

Table VII shows the yields of grain obtained from plantings at different depths, from one to three inches, over a period of six years, being the average yields obtained from all dates of planting. In compiling this table the yield of the three-inch planting for June 5, 1888, has been omitted, because of the immature condition and consequent excessive weight of the grain. It will be noted that with the exception of 1884, and possibly of 1888, the crop has uniformly been larger from the shallower plantings.

A reason for the better success of the deeper planting may be found by referring to Tables VIII and IX, which give the total rainfall and the mean temperature at the Station during April, May and June, for six years. It will be seen that June, 1884, was abnormally hot and dry, the mean temperature being higher than for any other June, except that of 1888, during the six years, and the rainfall being but about one-fourth the average. Moreover, by referring to table VI, it will be seen that planting

was not commenced in 1884 until May 22d. Apparently, when our knowledge of meteorology shall become so perfect that we may predict the condition of the weather a month in advance, we shall know that if we are planting late, and just previous to a long spell of hot, dry weather, we should plant deep.

CORN.—TABLE VIII.—RAINFALL ON THE STATION FARM DURING APRIL, MAY AND JUNE, FOR SIX YEARS.

Month.	1883.	1884.	1885.	1886.	1887.	1888.
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
April.....	3.06	2.40	4.51	3.25	4.45	2.39
May.....	5.72	4.34	5.92	6.91	4.36	6.67
June.....	4.25	1.11	4.84	2.23	5.47	2.43

CORN.—TABLE IX.—MEAN TEMPERATURE AT THE STATION FOR APRIL, MAY AND JUNE, FOR SIX YEARS.

Month.	1883.	1884.	1885.	1886.	1887.	1888.
	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>	<i>Degrees.</i>
April.....	48.1	48.5	49.0	53.1	48.2	46.3
May.....	58.0	59.3	59.3	63.5	66.3	60.1
June.....	69.0	71.1	65.8	68.5	70.7	71.1

The corn used in this experiment was of the variety called Hess' White. With the exception of the last planting, on June 5, the corn matured and dried out in good condition for going into the crib, the percentage of nubbins in no case exceeding 20. In the last planting the nubbins were perhaps no greater in quantity than the preceding, but scarcely any of the corn from this planting was marketable, and but a very small proportion would have kept if placed in a crib. In respect to the corn planted three and four inches deep, it was noticed that there was considerable variation in the time of its coming up. The rows planted one and two inches deep came through the ground within one or, at most, two days of each other, but the one planted three inches deep was delayed at least forty-eight hours after the second row came up, while that planted four inches deep was at least forty-eight hours behind the one planted three inches deep. Moreover, the one planted four inches deep was very irregular in coming up. The corn planted three and four inches deep seemed to retain its vitality longer than that planted at less depth. The roots of the deep planted corn were found, as we should naturally expect,

deeper in the soil than where the corn was planted more shallow, their opportunity to secure food and moisture was materially ended.

TABLE X.—AVERAGE YIELD OF STALKS FROM PLANTING AT DIFFERENT DEPTHS.

Depth of planting.	Planted on April 26, May 5, 15 and 25, and June 5, 1888.		
	Average yield of stalks per acre.	Average No. of stalks to 100 lbs. of corn.	Average No. of days from planting to ripening.
	<i>Lbs.</i>		
1 inch	6280	141	124
2 inches	6031	152	123
3 inches	5963	147	124
4 inches	5678	138	124

In Table X we find a gradual falling off in weight of stalks from the test covering down to the deepest.

The number of days from planting to maturing is quite uniform. However, as before, attention is called to the fact that on the latest seeded plots the corn was not matured, but was cut on the 28th of September to save it from frost; for this reason, in making the averages, both of stalks per acre and number of stalks per hundred pounds of the planting of June 5 has not been included.

In conclusion, it should be said that our experiment on early and late seeding, and upon deep and shallow planting, for this season, has been very unsatisfactory, largely because of the peculiar fall, which was not only an exceptionally wet one, but was also abnormally warm; hence the corn and fodder could not dry by the action of sun and wind, nor by artificial drying, and consequently neither corn nor fodder was in a perfect state for comparison of results.

III. DISTRIBUTION OF SEED.

The character of the land upon which a crop is grown largely determines the distance apart at which the plants should stand, and the question is often asked, "how thick can we grow corn-stalks and get the best yield per acre of salable grain?" Hence, with the belief that this question is worthy of further consideration, and will be of interest to the farmers, we have continued the test, begun some years ago, and the

results will be found in Table XI, the yields of grain being bushels of 70 pounds.

CORN.—TABLE XI.—DISTRIBUTION OF THE SEED.

Plot No.	Kernels planted in each hill.	Yield as weighed from field.	Yield corrected to a full stand.	Yield of fodder per acre.	Percentage of ear
		<i>Bus.</i>	<i>Bus.</i>	<i>Lbs.</i>	<i>Per cent.</i>
1	1 grain every 6 inches.....	81.42	86.14	5340	40
2	1 grain every 12 inches...	86.28	103.71	4340	83
3	1 grain every 18 inches...	78.28	80.28	4320	79
4	2 grains every 6 inches...	63.14	75.14	7300	30
5	2 grains every 24 inches..	69.42	77.71	3900	80
6	2 grains every 36 inches..	66.85	72.28	2560	85
7	3 grains every 45 inches..	69.42	69.74	3340	83
8	3 grains every 18 inches..	100.00	128.00	4500	63
9	3 grains every 36 inches..	80.85	105.51	3300	87
10	3 grains every 54 inches..	61.42	94.58	2160	82
11	4 grains every 24 inches..	75.71	77.14	4420	54
12	4 grains every 48 inches..	92.57	102.85	4900	81
13	4 grains every 72 inches..	64.32	68.57	3800	84
14	3 grains every 45 inches..	66.57	66.71	3320	84
	<i>Averages.</i>				
	Grains 6 inches apart.....	85.71	96.7	4753	54
	Grains 12 inches apart.....	82.28	97.4	4110	83
	Grains 18 inches apart.....	67.72	78.9	3210	83

It may be observed that plots 1 and 4 in this table have given a higher fodder product than any of the rest. Number 1, where the stalks were six inches apart, gives almost a half ton more than any other plot, while number 4, having twice as many stalks as number 1, gives a ton more fodder than any of the rest. Again we observe that plots 1 and 4 are very much higher in their percentage of nubbins than the rest; one being three-fourths nubbins and the other over four-fifths. We may also note the fact that the fodder in both these plots was greener when cut than in any of the others. The conclusion reached by Mr. Devol, in the report of 1887, is by this work confirmed, that where the stalks are thicker on the ground they are not necessarily more slender, but carry their size; hence, with a decrease in grain yield, we have an increase in fodder yield; that is, in the case of close planting. This point in fodder weight is further confirmed by the averages of plots bearing the same number of stalks; plots 1 and 11 have the same number of stalks, but it will be observed that where the distribution varies, the weight of fodder also varies. This will be true throughout the entire series, with one exception, namely, plot

group 2, 5 9 and 12; the remaining group being numbers 3, 6 and 10. Where the stalks average six inches apart the average of full sized ears is reduced to 54 per cent.—nearly one-half. The average yield is as high, or higher, where the stalks average 12 inches apart, and the large ears average 82 per cent., or more than four-fifths. Where the stalks average 18 inches apart, the average total yield of grain is reduced by about fourteen bushels per acre, while the per cent. of large ears is not materially increased.

In plot number 4 we have maximum of the nubbin yield—70 per cent. This is what any practical farmer would expect from such close planting.

IV. SEED FROM DIFFERENT PARTS OF THE EAR.

Upon the same soil as that used in the present experiment we planted three duplicate plots with seed from different parts of the ear, namely, from the butts, from the middles, and from the tips. The results of the experiment are given in Table XII.

CORN.—TABLE XII.—SEED FROM DIFFERENT PARTS OF THE EAR.

Yield per acre, corrected to full stand.

Plot No.	Seed from—	Grain.			Fodder.
		Total.	Percent. of of ears.	Percent. of nubbins.	
		<i>Bus.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Lbs.</i>
15.....	Butts	83.28	80	20	5450
16.....	Tips.....	78.85	75	25	4751
17.....	Middles.....	84.28	81	19	5308
18.....	Butts	75.42	76	24	1668
19.....	Butts	82.14	89	11	1743
20.....	Tips.....	72.85	86	14	2636
21.....	Tips.....	78.00	83	17	2165
22.....	Middles.....	79.42	85	15	2205
23.....	Middles.....	78.85	84	16	1506
	<i>Average.</i>				
	Butts.....	80.28	82	18	2953
	Middles.....	80.85	83	17	3006
	Tips.....	76.56	81	19	3184

The excessive weight of fodder from plots 15, 16 and 17 is probably due to variation in the soil. The three plots mentioned were upon soil more alluvial in its nature than the others, which were upon a soil having a larger proportion of clay in the sub-soil. The possible yield of corn from the butt grains averaged 80.28 bushels per acre, while the average

from the middle grains was 80.85 bushels, and that from the ear was 76.56 bushels per acre. These variations are too slight drawing any conclusions from this experiment alone. The ears and nubbins in the three groups is almost identical.

A similar experiment to the foregoing, made at this Station produced the following yields of grain per acre, corrected to 1

Seed from—	Total yield.	Per cent. of ears.
	<i>Bushels.</i>	<i>Per cent.</i>
Butts	57.7	66.9
Middles	48.1	84.5
Tips	53.6	87.8

V. DIFFERENT AMOUNTS OF CULTIVATION.

This is an experiment which the Station has followed up years, usually using the same land year after year. This year was made, not on the same land as in previous years, but upon similar soil, a clay loam with clay sub-soil, and below this a stratum of sand. The preparation and management of this land, prior to planting, was in all respects uniform. The several plots were of the one-tenth acre each. The management during the growing season was the only point of difference in treatment between the time of the plowing and the husking of the corn. Table XIII gives the yields of different amounts of cultivation as deduced from the yield of several plots under consideration.

Taking the yields of plots 1 and 5 in Table XIII, we get an actual yield from seven workings, from June 16 to July 10, of 70.27 bushels, and a possible yield of 85.58 bushels per acre. The fodder yield from the same plots, 7000 pounds, or three and one-half tons, per acre. The average actual yield from six workings, on plots 3 and 8, which had five workings from June 16 to August 10 inclusive, yielded 67.50 bushels per acre actual yield, and 83.03 bushels per acre possible yield; the fodder yield from these two plots being 2500 pounds from either of the other two groups cited. This variation in yield is large enough to have any special significance.

CORN.—TABLE XIII.—DIFFERENT AMOUNTS OF CULTIVATION.

Plot No.	Times and dates of cultivation.	Grain.		Fod- der, yield per acre.
		Actual yield per acre.	Correct- ed yield per acre.	
		<i>Bus.</i>	<i>Bus.</i>	<i>Lbs.</i>
1	Seven—June 16, 20, 24, 28, July 2, 6 and 10	66.85	84.06	6900
2	Six—June 16, 24, July 2, 10, 18 and 26.....	70.14	85.00	7400
3	Five—June 16, 28, July 12, 24, and August 3.....	69.00	80.74	7100
4	Four—June 16, July 2, 18, and August 3.....	71.71	85.24	7100
5	Seven—June 16, 20, 24, 28, July 2, 6 and 10.....	59.00	67.27	7100
6	Three—June 16, July 18, and August 22.....	72.57	89.30	7300
7	Six—June 16, 24, July 2, 10, 18 and 26.....	70.40	86.16	6600
8	Five—June 16, 28, July 12, 24, and August 3.....	66.00	85.33	6400
	<i>Averages.</i>			
	Seven workings—two plots.....	62.92	75.66	7000
	Six " "	70.27	85.58	7000
	Five " "	67.50	83.03	6750
	Four workings—one plot.....	71.71	85.24	7100
	Three " "	72.57	89.30	7300

It would seem, on comparison of plots 1 and 5 with plots 2 and 7, the first pair having been cultivated seven times, the last working being given July 10, and the second pair having been worked six times, the final working July 26, that later cultivation is of more benefit than frequent cultivation. There is practically no difference in the yields of the plots cultivated four, five and six times, the cultivation extending to July 26 and August 3; but it is a little surprising to find the largest yield from the plot cultivated but three times, at intervals of a month.

The experiments previously made at this Station fail to show any advantage from excessive cultivation. Three cultivations, when judiciously distributed, have thus far given as good yields as the best.

The implement used in this work was the ordinary double shovel.

VI. METHODS OF CULTIVATION.

These experiments in methods of cultivation were conducted upon the same land as the experiments in different amounts of cultivation, namely, a clay loam with clay sub-soil and gravel beneath. The plowing, harrowing, and other cultivation previous to planting, was the same for the several plots. The planting, however, as in the other experiment, was done after the 20th of May. In this experiment, and in the previous one, the dates of ripening ready for cutting did not vary, but all seemed to be ready at one time.

CORN.—TABLE XIV.—METHODS OF CULTIVATION.

Plot No.	Implement used.	Times and dates cultivated.	Grain.		Fod- der, actu- al yield per acre.
			Actual yield per acre.	Cor- rected yield per acre.	
			<i>Bus.</i>	<i>Bus.</i>	<i>Lbs.</i>
9	Harrow	1—June 16, weeds pulled during season....	67.14	83.42	6200
10	Harrow	3—June 16, July 16 and 26.....	73.71	93.47	5700
11	Cult. & db. shovel..	3—June 16, July 16 and 26.....	76.14	88.12	4600
12	" " ..	10—June 16, 20, 24, 28, July 2, 6, 12, 16, 19, 26.	71.85	88.05	5600
13	Cultivator.....	5—June 16, 28, July 12, 16, 26	77.57	93.27	5600
14	Double shovel.....	5—June 16, 28, July 12, 16, 26.....	82.71	95.10	6400
15	Cultivator.....	4—June 16, 28, July 16, 26.....	77.14	94.00	5500
16	Double shovel.....	4—June 16, 28, July 16, 26.....	79.00	103.34	5800
	<i>Averages.</i>	<i>Averages.</i>			
	Surface	Plots 10, 13, 15	76.14	93.58	5600
	Deep	Plots 11, 14, 16	79.28	95.52	5600

Plots 10, 13 and 15 may be justly considered as surface and flat cultivation, while plots 11, 14 and 16 are properly classed as deep cultivation with ridge culture. The difference manifested in the results is not sufficient to justify us in drawing conclusions.

We have also, in this connection, made an experiment in working several plots the same number of times, but increasing the intervals between workings in the different plots. The products from these several plots do not show any material differences, hence the details of the experiment are omitted.

VII. COMMERCIAL FERTILIZERS ON CORN.

The experiments in the use of commercial fertilizers on corn, hitherto made at this Station, have from necessity been made upon a limited area of undrained or imperfectly drained soil, and their results have consequently been quite unsatisfactory. In order to eliminate, as far as possible, the sources of error which arise from defective drainage, the plat of land devoted to this experiment heretofore was abandoned in the spring of 1888, and a new plat selected in another field of the farm, where the conditions, as respects natural fertility, contour of the surface, etc., were as nearly uniform as possible, and this was laid off in a series of twenty-two plots, the plots being sixteen feet wide by 272 feet long, containing one-tenth acre each, and separated by alleys two feet wide.

CORN.—ARRANGEMENT OF PLOTS AND DISTRIBUTION OF FERTILIZERS.

1. Unfertilized.
2. Superphosphate (dissolved bone-black.)
3. Potash (muriate.)
4. Unfertilized.
5. Nitrate Soda.
6. Superphosphate and nitrate.
7. Unfertilized.
8. Superphosphate and potash.
9. Potash and nitrate.
10. Unfertilized.
11. Superphosphate, potash and nitrate.
12. Superphosphate, potash and nitrate, two-thirds.
13. Unfertilized.
14. Superphosphate, potash and nitrate, one-third.
15. Superphosphate, potash and ammonia.
16. Unfertilized.
17. Nitrate, potash and rock phosphate.
18. Nitrate, potash and slag phosphate.
19. Unfertilized.
20. Barn-yard manure.
21. Linseed oil-meal.
22. Unfertilized.

Between every second pair of plots a tile drain was placed, the drains emptying into a main at the foot of the plots. On these plots commercial fertilizers were used, according to the diagram on page 89, every third plot being left without any fertilizer in order to have an unfertilized plot on one side or the other of each fertilized one.

The diagram shows the arrangement of the plots and the distribution of the fertilizers, also the arrangement of the drains, which are represented by broken lines. Around the outside of the entire plot a drive-way twelve feet wide was left, to serve both for passage and for turning in cultivation.

The ground was not plowed until quite late, on account of the ditching, which was completed about the 23d or 24th of May. The plowing was then done immediately, and, after dragging and harrowing, and some necessary leveling, the fertilizers were applied broadcast and harrowed in. The planting of corn was therefore not done until the 26th of May, the same day that the fertilizers were applied and the harrowing done.

The ground was marked both ways, three feet nine inches wide, and Leaming corn planted. The ground was in most excellent condition and the weather very warm, so that in three days after planting the corn was nearly all coming through the ground. The corn was harrowed on June 2, and received four workings with the cultivator afterwards, hence it received about such attention as the average farmer would be likely to give his corn. The hills were thinned to three stalks each, and each plot received treatment as nearly like all the others as was possible, except in the fertilizers applied. To sum up, the ground was all plowed upon the same day and harrowed, and the fertilizers were applied and harrowed in, and the corn all planted upon the same date. The workings of the corn were uniform; that is, when one plot was worked all the rest were worked upon the same date. When, however, it came to cutting, some plots remained green a few days longer than others.

These variations will be noted further on. From these experiments we hoped to get answers to several questions: First, does our land need artificial manures? If so, in what form? May we apply them as single elements, such as potash, phosphoric acid, or nitrogen alone, or must we make it more expensive by adding two of these? Or can we combine the three and get results that will justify the additional outlay? Again, must we apply phosphoric acid as we can buy it in dissolved bone-black, or can we use the cheaper Thomas' slag, or South Carolina rock-phosphate, with results equally good? Then the problem that comes up after all is, can we get any better results from these than from barn-yard manures? These are some of the problems which the experiment with fertilizers on corn seeks to answer. Table XV shows the fertilizers applied and the results.

Plot No.	Treatment.	Fertilizers per acre.	Grain.				Fodder, yield per acre.	
			Yield per acre.		Per cent. ears.	Per cent. nubbins.	Actual.	Corrected.
			Actual.	Corrected.				
		Lbs.	Bus.	Bus.		Lbs.	Lbs.	
1	Unfertilized.....	.....	82.5	86.0	76	24	7300	7600
2	Dissolved bone-black.....	300	79.8	83.0	78	22	5940	6195
3	Muriate of potash.....	200	85.1	89.4	64	36	7040	7255
4	Unfertilized.....	.....	86.1	94.2	81	19	5900	6195
5	Nitrate of soda.....	480	82.0	91.4	78	22	7500	8256
6	Nitrate of soda..... Dissolved bone-black.....	{ 480 } { 300 }	93.2	96.8	79	21	6900	7171
7	Unfertilized.....	.....	90.4	93.0	80	20	6500	6689
8	Dissolved bone-black..... Muriate of potash.....	{ 300 } { 200 }	87.4	89.5	76	24	6500	6661
9	Nitrate of soda..... Muriate of potash.....	{ 480 } { 200 }	90.8	93.1	81	19	7600	7805
10	Unfertilized.....	.....	90.5	92.1	76	24	7100	7271
11	Dissolved bone-black..... Muriate of potash..... Nitrate of soda.....	{ 300 } { 200 } { 480 }	75.8	85.7	68	32	6000	6959

CORN.—TABLE XV.—Concluded.

Plot No.	Treatment.	Fertilizers per acre.	Grain.				Fodder, yield per acre.	
			Yield per acre.		Per cent. ears.	Per cent. nubbins.	Actual.	Corrected.
			Actual.	Corrected.				
			<i>Bus.</i>	<i>Bus.</i>			<i>Lbs.</i>	<i>Lbs.</i>
12	Dissolved bone-black.....	<i>Lbs.</i> { 300 } { 200 } { 320 }	81.2	93.7	79	21	5600	6456
13	Muriate of potash.....							
	Nitrate of soda.....		74.8	90.5	78	22	6000	7260
14	Unfertilized.....							
	Dissolved bone-black.....	{ 300 } { 200 } { 160 }	73.7	89.2	71	29	5840	7087
15	Muriate of potash.....							
	Nitrate of soda.....							
	Dissolved bone-black.....	{ 300 } { 200 } { 120 }	77.2	88.0	78	22	6540	7475
16	Muriate of potash.....							
	Sulphate of ammonia.....							
	Unfertilized.....		70.2	87.4	74	26	4500	5606
17	Nitrate of soda.....	{ 480 } { 200 } { 300 }	78.1	89.2	79	21	6400	7235
	Muriate of potash.....							
	Rock phosphate.....							
18	Nitrate of soda.....	{ 480 } { 200 } { 400 }	75.1	89.4	75	25	5600	6670
	Muriate of potash.....							
	Slag phosphate.....							
19	Unfertilized.....		72.7	78.6	66	34	6000	6538

Table XV fails to answer satisfactorily any of the questions proposed; but it does seem to give an answer that we were not seeking with the same interest that we were some others, and that is that our soil does not need artificial manures, and consequently the money used in buying these commercial manures was simply money expended without any return. This is a very important point with the farmers of Ohio to-day, and should call attention to the fact that artificial manures do not necessarily increase the yield. If our land already has abundant plant food in available form, then the application of any manure is superfluous. Not having found any increase in the yield, we will prepare another table in which we ask the question, does the corn grown from one kind of fertilizer shrink more than corn grown from some other kind, or does one kind of fertilizer produce more corn and less cob than another? Table XVI will show results on this point.

An examination of Table XVI does not reveal any effect from the fertilizers. We find some variations in shrinkage, some variations in amount of shelled corn from one hundred pounds of corn as weighed in the field, also some variations in amount of cobs from a hundred pounds of corn; but these differences are slight, and furthermore the differences in weight are as great between plats having the same treatment as they are between plats having entirely different treatment; hence we cannot draw any conclusions. This experiment, then, throughout, is of no particular benefit while it stands alone. It should be noted, however, that the season has been a favorable one in nearly every respect, and especially suited to corn growth. Under less favorable conditions our work might have given quite different results. As it is we give it to the public with the explanation that the same experiment will be continued for a series of years upon the same plats, hence this season's work will be continued in after years, and the proof of the fertility of the land, as demonstrated by this year's work, may be of importance and interest in the years to come.

It should be stated that the negative results of this test are precisely what was expected when the work was undertaken. It is expected, however, that as the natural fertility of the soil becomes exhausted by continuous cropping, the effects of fertilizers will be made more apparent.

CORN.—TABLE XVI.—SHRINKAGE IN DRYING, WEIGHT OF GRAIN AND COBS.

No. of Plot	Kinds and amounts of fertilizers applied.	Weight in the field, November 17.	Weight January 25.	Loss.	Weight of shelled corn.	Weight of cobs.	Weight of measured half-bushel.
		Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1	Unfertilized.....	100	85	15	69	16	27
2	Dissolved bone-black, 300 lbs.....	100	84	16	67	17	27
3	Muriate of potash, 200 lbs.....	100	82	18	66	16	27
4	Unfertilized.....	100	80.5	19.5	66	14.5	25.5
5	Nitrate of soda, 480 lbs.....	100	80	20	65	15	26
6 {	Nitrate of soda, 480 lbs.....	100	81	19	65	16	26
	Dissolved bone-black, 300 lbs.....						
7	Unfertilized.....	100	86	14	69	17	27
8 {	Dissolved bone-black, 300 lbs.....	100	84	16	67	17	25
	Muriate of potash, 200 lbs.....						
9 {	Nitrate of soda, 480 lbs.....	100	83	17	67	16	26
	Muriate of potash, 200 lbs.....						
10	Unfertilized.....	100	83	17	67	16	26
11 {	Dissolved bone-black, 300 lbs.....	100	84	16	67	17	26
	Muriate of potash, 200 lbs.....						

FARM TESTS.

The Experiment Station, as a means of widening its usefulness, has undertaken a limited amount of work in other parts of the State, where the soil is altogether different from the land at the station proper. This work we term co-operative, or farm tests. The object of this work is patent to any one who has any knowledge whatever of the great variation of soils and of their needs. It is generally understood by the farmers that the needs of one soil are not necessarily the needs of other soils, but that an application of certain fertilizers to one soil may increase its yield tenfold, while the same fertilizer applied to a soil twenty miles away may not have any effect whatever. These farm tests will enable the Station to study the different soils of the State, to inquire into their characteristics, and determine their most economical treatment. It is hoped that this system of investigation will eventually prove to be a great benefit to the agricultural interests of the several parts of the State, for, if it is properly carried out, a few years at most should suffice to give us a general outline of the various soils of the State, and an approximate idea as to what fertilizer, or combinations of fertilizers, can be applied most economically in various localities. These are problems of most vital interest to our farmers to-day, and while their solution cannot be given in a few days or months, yet we believe it can be given in a few years.

One of these farm tests has been located in the eastern part of the State (Columbiana county). The location is on a high "soapstone," or slaty point. This stratum of slate is possibly ten feet deep, and that, with its elevation, gives abundance of natural drainage. The natural condition of this kind of soil is quite loose and open, always easily worked. We are justified in saying that fully one-half of this soil is made up of small slate stones, from the size of a ten-cent piece up to and somewhat larger than a silver dollar. In general terms it is considered poor land—just the place for such investigations as we wish to make. Owing to the fact that the Experiment Station was not completely organized under the Hatch Act until the first of April, 1888, our work was somewhat retarded all around, hence arrangements for this farm test were not completed until late in May. The object of this farm test was to duplicate experiments made at the central station, the outline, plan, and special features of which have been given, and also the results. It may be noticed, however, that we have curtailed somewhat the work here, for, while the plan given shows twenty-two plats, of one-tenth acre each, the farm test has only fourteen plats, of one-tenth acre each. The ground was plowed and harrowed May 18th; fertilizers were sown broadcast and harrowed in on May 21st; and the corn planted on May 22d, rows three feet six inches

apart, and the hills three feet six inches apart in the row. The same points were observed in carrying out this experiment as were described for the more elaborate one on the preceding pages. The ground was laid out and the general work looked after by the Agriculturist of the Station, but the carrying out of the details and the immediate supervision was done by Mr. Henry Bentley, free of charge to the Station. To him belongs the credit for the care and attention given the work. In Table XVII we give fertilizers applied and results obtained :

CORN.—TABLE XVII.—EXPERIMENTS WITH FERTILIZERS ON CORN.

Number of Plot.	Fertilizers applied.		Grain.		Fodder.	
	Kind.	Amount per acre.	Actual yield.	Corrected yield.	Actual yield.	Corrected yield.
		<i>Lbs.</i>	<i>Bus.</i>	<i>Bus.</i>	<i>Lbs.</i>	<i>Lbs.</i>
1	Unfertilized .....	.....	33.4	51.7	4220	4520
2	Dissolved Bone-black	300	34.2	53.8	4420	4640
3	Muriate of Potash.....	200	37.7	56.8	4820	5050
4	Unfertilized .....	.....	40.8	60.3	4440	4770
5	Nitrate of Soda.....	480	67.1	76.7	5480	5800
6 {	Nitrate of Soda.....	480	85.4	93.2	5700	6030
7 {	Dis'lv'd Bone-bl'ck }	300				
8 {	Unfertilized .....	.....	65.7	94.5	4240	4580
9 {	Dis'lv'd Bone-bl'ck }	300	66.5	91.8	5060	5390
10 {	Muriate of Potash.. }	200				
11 {	Nitrate of Soda.....	480	87.1	94.7	6340	6590
12 {	Muriate of Potash.. }	200				
13	Unfertilized .....	.....	65.7	86.4	4620	4960
14	Dis'lv'd Bone-bl'ck }	300	71.1	94.8	6180	6500
	Muriate of Potash.. }	200				
	Nitrate of Soda.....	480	58.5	89.5	4860	5140
	Barnyard manure.....	16 tons				
	Unfertilized .....	.....	56.2	86.0	5090	5530
	Common Salt.....	400	56.2	84.5	5420	5810
	<i>Averages.</i>					
	Unfertilized .....	.....	52.3	75.8	4522	4872
	Dis. B'ne-blk & P't'sh.....	.....	46.1	67.5	4767	5027
	Nitrate of Soda.....	.....	77.7	89.8	5925	6230

The results, as shown in this table, indicate that the land is not strictly uniform, but that there is a gradual increase in fertility, or productiveness, from plot 1 up to plot 7 or 8. A superficial survey of the soil, or land, would not confirm this indication, but the product, from a practical standpoint, is a sufficient proof of at least a slight variation in productiveness. A careful reading of the third column of figures from plot 1 up to and including plot 4, shows this variation, or change, to be a very gradual and regular one. Taking the unfertilized plots, we find the aver-

actual yield of plots 1, 4, 7, 10 and 13 (all unfertilized) to be 52.3 bushels per acre. The possible product from these five plots, if all the stalks had borne ears averaging the size of those that did bear, would be 67.5 bushels per acre.

Averaging plots 2, 3, and 8, to which dissolved bone and muriate of potash were applied, we find 46.7 bushels actual yield, and 67.5 bushels possible yield per acre; comparing this with the results from the unfertilized plots, we reach the conclusion that phosphoric acid, as applied in dissolved bone, and muriate of potash, either alone or in combination, have, in this case, benefited our crop.

Now, taking plots 5, 6, 9 and 11, all of which received an application of nitrogen in the form of nitrate of soda, we discover that our results average 77.7 bushels per acre, actual yield, with a possible yield of 89.8 bushels. This seems to give definite evidence of beneficial results from application of nitrogen, either alone or in combination with phosphoric acid and with potash. Now, taking all the plots not receiving nitrogen, either in barn-yard manure or nitrate of soda, namely, 1, 2, 3, 4, 8, 10 and 14, we get an average yield of 48.7 per acre, and a possible average yield of 71.7 bushels per acre. Comparing these figures with the results from those plots to which nitrogen was added, we find that plots receiving nitrogen have averaged more than fifty per cent. better actual yield to the acre, and within about twenty per cent. of a possible yield. To explain the cause of this greater possible yield, we give Table III.

Our experience with the kind of soil upon which this experiment was carried out has, in years gone by, revealed the fact that it produces many barren stalks, some of which make a slight effort to produce ears, but the greater portion do not even have the appearance of having started an ear; it has, however, never been realized that the proportion of barren stalks was so great as this work has revealed. It has already been stated that these hills were three feet and one-half apart each way, and that each hill was composed of three stalks. This gives us a possible 990 stalks to an acre. Having counted the ears, the nubbins, and the missing stalks, we can then easily estimate the number of barren stalks. These we have placed in the first column of Table XVIII, a glance at which shows the effect of the beneficial results from the use of fertilizers containing nitrogen. The number of stalks on these several plots varied but little, but the number bearing ears or nubbins of corn varied considerably. Upon unfertilized plots the average not bearing ears was 241 stalks. Upon plots to which dissolved bone alone was added, and where dissolved bone and muriate of potash were used together, the average of barren stalks was 254.

CORN.—TABLE XVIII.—EXPERIMENTS WITH FERTILIZERS ON CORN—Continued.

Table showing percentages of ears and nubbins from different fertilisers; also showing number of stalks not bearing ears.

Number of Plot.	Kind of fertilizer and amount applied.	Number of barren stalks.	Per ct. of ears.	Per ct. of nubbins.
1	Unfertilized.....	304	74	26
2	Dissolved Bone-black, 300 lbs.....	312	66	34
3	Muriate of Potash, 200 lbs.....	286	65	35
4	Unfertilized.....	252	71	29
5	Nitrate of Soda, 480 lbs.....	69	84	16
6 {	Nitrate of Soda, 480 lbs.....	30	86	14
	Dissolved Bone-black, 300 lbs. }			
7	Unfertilized.....	228	80	20
8 {	Dissolved Bone-black, 300 lbs. }	196	81	19
	Muriate of Potash, 200 lbs.....			
9 {	Nitrate of Soda, 480 lbs.....	41	86	14
	Muriate of Potash, 200 lbs.....			
10	Unfertilized.....	169	77	23
11 {	Dissolved Bone-black, 300 lbs. }	197	82	18
	Muriate of Potash, 200 lbs.....			
	Nitrate of Soda, 480 lbs.....			
12	Barn-yard Manure, 16 tons per acre.....	288	78	22
13	Unfertilized.....	253	71	29
14	Common Salt.....	264	71	29

When potash was applied alone and in combination with dissolved bone, the average of barren stalks to each tenth-acre was 241; but where nitrogen as nitrate of soda was used, not only alone, but also in combination with each of the others, the number of barren stalks is reduced to an average of 84 to each tenth-acre. The same process of calculation brings out similar percentages of ears and nubbins; that is, where the nitrate was not used, the percentage of ears was decreased and the percentage of nubbins increased; and where the nitrate was used, the per cent. of ears was increased and the per cent. of nubbins decreased.

There is another point that should be mentioned, and that is, that during the growing season, the plots to which nitrate of soda had been applied could be distinguished from the others at a distance of one hundred rods. There were at first two points of distinction, namely, the size and the color. In size the nitrate plots were a little ahead all the way through, but after they seemed to have ceased their upward growth the others continued to grow, and, eventually, the several plots were apparently of the same height. But even after this, the nitrate plots could still be distinguished by their color. We were not able to make any observations after these plots reached their growth. There is a possibility that the nitrate plots matured earlier than the others, but we have no evidence upon that point, either pro or con.

CONCLUSIONS.

From the experiment conducted on the Station land we can find slight indications of the effects of the fertilizers, but they are so slight we deem it best not to attempt to draw any definite conclusions from single experiment, further than to say that in our opinion the work shows evidence that a soil that will produce from eighty to one hundred bushels of shelled corn per acre is not benefited by the addition of commercial fertilizers. From the farm test, however, made on soil of less natural fertility, we deduce the following conclusions with respect to that particular soil:

First. This work proves, first, that the plan of experimenting is not faulty, but shows that the application of commercial manures is in some cases attended with good results.

Second. It indicates that potash and phosphoric acid applied either alone, or the two combined, do not increase the yield over unfertilized soil.

Third. It shows that nitrates, applied either alone or in combination with either phosphoric acid or potash, or applied in combination with potash, add to the yield per acre.

Fourth. The increase in yield is made in two ways: first, by causing the growth of the otherwise barren stalks to produce ears; and second, by reducing the percentage of nubbins.

Fifth. Nitrates used alone or in combination also increased the weight of the fodder per acre.

In conclusion I would emphasize the point that the above does not apply to every soil, but shows the effects of artificial manures upon a particular kind of soil.

REPORT OF THE HORTICULTURIST.

LETTER OF SUBMITTAL.

SIR: The work in the Horticultural Department for 1888 may be outlined as follows:

- I. Comparisons of varieties and strains of varieties.
- II. Comparisons of effect of fertilizers upon crops, both upon quantity and quality of product.
- III. Comparisons of methods of planting and cultivation.
- IV. Comparisons of methods of treating seeds.
- V. Observations upon the effect of selection as illustrated by strains of varieties.
- VI. Observations on the influence of soil and climate upon the growing of seeds, as shown in vitality, vigor of plants produced and the resulting crops.
- VII. Experiments in ripening and keeping fruit.

The plan of the variety work the past season is a modification of that of former seasons. A special effort has been made to test new varieties with sufficient thoroughness to learn their probable value at the earliest possible date. This has been done by making duplicate tests, and by sending out seeds and plants to practical growers in different parts of the State. The most reliable of the old varieties have been retained for comparison, but the lists have been much shortened by rejecting those that are unworthy of cultivation. The effort has been not merely to shorten the lists of varieties, but to call particular attention to those that are most worthy of general cultivation, the old as well as the new. Whenever practicable, the work has been carried on upon a larger scale than formerly, by increasing the size of the plots, thus adding to the trustworthiness of the results.

Varieties of strawberries, raspberries, blackberries and dewberries were reported upon in Bulletin No. 5, issued in August, 1888, and included in this report. Potatoes are treated in this report.

Two hundred and seventy-five samples of early and late cabbage were on trial. Many of these were duplicates, procured for the purpose of comparing strains, and to determine the true type of each variety; also to furnish sufficient material to determine synonyms. Less than fifty varieties are worthy of special mention, while not more than ten distinct sorts can be recommended for general cultivation. Many of the highly praised

ieties of the seed catalogs are found to be nearly worthless. The results of this test will be given in a bulletin before the opening of another season.

Seventy-two samples of cauliflower were on trial. Early and late plantings were made, both of which gave good crops. Nearly all of the samples tested deserve special mention, although the list contains many synonyms. A report of the trial will be given in the same bulletin with report on cabbage.

One hundred and twelve samples of peas were tested. The leading varieties and novelties were included, but the special object of the test was to determine the relative value of the various strains of Early Philadelphia under distinct names given by different seedsmen. The results will be given in a bulletin with reports on various vegetables.

Seventy-eight samples of celery were on trial. Many of these were duplicates procured for the purpose of comparing strains of varieties. Varieties that are distinct and valuable do not exceed half a dozen in number. A detailed report will be given in a future bulletin.

Ninety-seven samples of sweet corn were on trial, or about sixty varieties, some probable synonyms being undetermined. The results are to be given in a seasonable bulletin.

The fertilizer work, upon which a report can be made, has been confined to strawberries, a report of which was given in Bulletin No. 5.

The experiments in methods of culture were with celery, potatoes and strawberries, reports of which will be given in bulletins.

An experiment in treatment of seed potatoes was made, the results of which are given in this report.

In the study of the effect of selection in seed-growing, different strains of the most common varieties of vegetables have been compared, both in the growing season and in the quality and quantity of crop produced. The influence of soil and climate upon the growing seed has been studied, securing seed from different localities and comparing as to vitality, growth of plants and the resultant crops. The observations are to be given in bulletins treating of particular crops.

An experiment is now in progress comparing the keeping qualities of apples picked at different dates, the results of which will be given in a future bulletin.

The following announcement was published in Bulletins Nos. 2 and 5:

The testing of varieties of fruits and vegetables is an important part of the horticultural work of the Station, and is so conducted as to be of service to originators and to the general public. Varieties are received from originators and reports given to the owner from time to time, whenever desired. These partial reports are made public at the discretion of the Station, but are usually withheld until the variety is offered for sale,

and in case it is not thought worthy of introduction by the owner, no public report is made. Thus originators are aided in testing their productions, while the public has the advantage of early knowledge concerning new varieties, and is not burdened with reports of varieties that are unworthy of dissemination. Varieties that are sent for trial are not propagated beyond the requirements of experimentation, nor are plants, cuttings or scions of such varieties offered for sale, nor given away or exchanged, *without the consent of the owners*, but no responsibility will be assumed in case of theft, beyond a reasonable diligence to prevent it.

As far as possible, all varieties are subjected to the same conditions, and no agreement will be entered into to give special treatment in any case.

Varieties are not desired unless they are thought to have special merit. The Station cannot undertake to test long lists of seedlings, for the simple purpose of sifting out the undesirable varieties for the benefit of individuals. Unless a variety is likely to be disseminated, and thus become of public interest, it is not wanted, although no variety will be refused that is sent in good faith.

In addition to the testing of varieties, strains of varieties from different sources have been compared in case of vegetables. This work promises even greater usefulness than the testing of varieties proper. For this reason the Station is especially desirous of obtaining improved strains of varieties from commercial and private seed growers. Samples of this kind will receive careful attention and be given a thorough trial.

Care should be taken in sending new varieties to label the packages distinctly with the name or number of variety, and name of sender, together with postoffice address. A letter or card should be sent at the same time, giving full particulars as to origin and parentage, if known, and of such other facts as may be of interest.

In response to this announcement originators and others have sent for trial, the past spring, upward of one hundred and fifty varieties. In order to extend the work, and to secure co-operation with other experiment stations, the Horticulturist of the Station attended the annual convention of the American Association of Agricultural Colleges and Experiment Stations, held at Knoxville, Tennessee, January 1, 1889.

The horticulturists present at the convention drew up and submitted the following propositions, which were adopted by the convention :

"Believing that it is both desirable and necessary to secure co-operation among the several stations on certain work in horticulture, we submit the following propositions for your consideration :

"1st. The introduction of new varieties as at present conducted by *dealers* affords the public no opportunity to learn of their merits except by expensive and individual trials.

"2nd. As a rule, *originators* desire to have their new varieties tested under varying conditions of soil and climate, if such tests could be so conducted as to guard their interests.

"3rd. The general public desire, and, in fact, demand that early and reliable information be given concerning new varieties. It is clearly evident that this information cannot be given unless the stations can reach the originators and secure new varieties a sufficient length of time before they are offered for sale.

"4th. The experience of stations working in this line is that, acting independently, they fail to fully accomplish the purposes sought, for the following reasons :

"(a) It is difficult to learn the names of originators and of their products before they are put upon the market.

"(b) Originators do not know that the stations are willing and desire to make the tests.

"5th. Satisfactory comparisons cannot be made between the work of the several stations without securing a certain degree of uniformity in methods of testing and reporting.

"In general, we believe that the adoption of such a plan as here indicated would, to a certain extent, check the indiscriminate introduction of untried sorts, and the public would soon learn to demand that all new varieties show the record of official test.

"In the furtherance of the plan here outlined we request—should the convention see fit to adopt this paper—that the president be authorized to appoint a committee to formulate and put in operation a plan of work.

"To secure the ends sought it would be necessary for the stations desiring to carry on this work, to submit at once to this committee lists of names and addresses of such originators as they may know, and in future to send the names of originators of whom they may learn, to the Office of Experiment Stations at Washington, through which these names can be forwarded to the several stations. It would also be necessary to authorize this committee to print, with the advice of and through the Office of Experiment Stations, such lists and circulars as may be necessary for the general information of the stations desiring to co-operate."

The following committee was appointed to carry out the forgoing suggestions: William B. Alwood, of Virginia; W. J. Green, of Ohio; M. H. Beckwith, of Delaware.

The work of the committee has consisted, thus far, in the compilation of lists of originators and stations that will undertake such work, also the preparation of uniform blanks for reporting.

It is believed by those who have given the matter attention that co-operation will greatly assist individual stations, and when the work is fully organized the results will be of great value to originators and to the general public.

Originators wishing lists of stations where tests will be made, should communicate with the Department of Agriculture, Washington, D. C.

WILLIAM J. GREEN, *Horticulturist*.

CHAS. E. THORNE,

Director Ohio Agricultural Experiment Station.

I. STRAWBERRIES.

The strawberry crop of this year was far from satisfactory, owing to the drought of last season, which prevented the plants making a good growth. This season was very dry also, during the time of fruiting. The early varieties were not seriously affected, but none of the late sorts yielded more than two pickings. The entire season, from first to last ripe fruit, did not exceed three weeks, hence a fair report cannot be given of the late varieties.

SPRING VERSUS FALL-SET PLANTS.

Plants of nearly all varieties were propagated in beds early in July, 1887, and transplanted into the field the last of July and the first of August. The season was very unfavorable for transplanting, but by means of irrigation the plants were kept alive, although the growth was not satisfactory. These plants yielded about half as much fruit as the spring-set plants. On a few rows of Crescents, however, that were planted very closely—about six inches apart in the rows—the yield was nearly equal to that of the spring-set plants, while the fruit was much finer in appearance. This indicates that market gardeners might profitably grow strawberries as a second crop, by close planting, even though the yield is less than on plants that have had an entire season in which to grow. Planting later than August 1st does not seem to be desirable in this latitude, even though potted plants are used. The method is not practicable for commercial growers, who plant in large quantities, but it has decided advantages for those who wish to test varieties, and for those who practice high cultivation on small areas. The plan of taking the young buds, or tips of the runners, before or soon after they have become rooted, and planting in beds or in pots, giving shade and water until well rooted, has decided advantages over that of sinking the pots alongside the rows and causing the runners to take root in them.

COMPARISON OF VARIETIES.

The following table gives the weights and measurements taken of the newer and some of the leading old varieties; also date of first ripe fruit and first picking. The date of the first picking is given, because the date of first ripe fruit alone does not show comparative earliness, in many cases. It will be seen that these two dates are very near together in some cases, and a number of days apart in others. This is owing to the fact that some varieties ripen a few berries quite early, but afford no picking for several days, while others yield good picking from the start. A fair picking could have been made from the Crescent and Covell two or three days before the time noted, but generally the pickings were made as though intended for market. This was kept up throughout the season. Weights and measurements were taken at each picking of twenty-five average berries, and of five selected berries. Owing to the drought, which cut the crop short, the length of season cannot be given. A sufficient number of samples could not be obtained of all the new varieties on trial.

STRAWBERRIES.—TABLE I.—COMPARISON OF VARIETIES.

Name of Variety.	Date of first ripe fruit.	Date of first picking.	Weight of five selected berries.	Weight of one hundred average berries.	Average diameter of five selected berries.
Anna Forest.....	June 6th.	June 13th.	1 $\frac{1}{8}$ oz.	20 $\frac{1}{8}$ oz.	1 $\frac{1}{8}$ in.
Belmont	June 11th.	June 13th.	2 $\frac{7}{10}$ oz.	25 $\frac{1}{2}$ oz.	1 $\frac{1}{8}$ in.
Bubach.....	June 6th.	June 8th.	2 $\frac{3}{10}$ oz.	37 $\frac{3}{8}$ oz.	1 $\frac{3}{8}$ in.
Crescent	May 30th.	June 6th.	1 $\frac{3}{8}$ oz.	21 $\frac{3}{8}$ oz.	1 $\frac{1}{8}$ in.
Cumberland	June 6th.	June 7th.	2 $\frac{1}{10}$ oz.	32 oz.	1 $\frac{1}{8}$ in.
Covell	May 29th.	June 6th.	1 $\frac{3}{10}$ oz.	17 oz.	1 $\frac{1}{8}$ in.
Champion	June 4th.	June 6th.	1 $\frac{3}{8}$ oz.	22 $\frac{3}{8}$ oz.	1 $\frac{1}{8}$ in.
Downing	June 6th.	June 9th.	1 $\frac{9}{10}$ oz.	27 oz.	1 $\frac{1}{8}$ in.
Gold	June 11th.	June 13th.	2 oz.	30 oz.	1 $\frac{1}{8}$ in.
Gandy	June 7th.	June 11th.	2 $\frac{1}{2}$ oz.	31 oz.	1 $\frac{1}{8}$ in.
Jewell.....	June 4th.	June 6th.	2 $\frac{3}{10}$ oz.	30 $\frac{3}{8}$ oz.	1 $\frac{1}{8}$ in.
Jessie	June 4th.	June 6th.	3 $\frac{1}{2}$ oz.	35 $\frac{1}{2}$ oz.	1 $\frac{1}{8}$ in.
Lida	June 5th.	June 6th.	2 oz.	32 oz.	1 $\frac{1}{8}$ in.
Miner's Prolific.....	June 6th.	June 7th.	2 $\frac{1}{10}$ oz.	26 $\frac{3}{8}$ oz.	1 $\frac{1}{8}$ in.
May King.....	June 4th.	June 6th.	1 $\frac{3}{8}$ oz.	21 $\frac{7}{10}$ oz.	1 $\frac{1}{8}$ in.
Ontario	June 11th.	June 11th.	2 $\frac{1}{8}$ oz.	27 oz.	1 $\frac{1}{8}$ in.
Old Iron Clad.....	June 2d.	June 6th.	1 $\frac{3}{10}$ oz.	15 oz.	1 in.
Ohio	June 14th.	June 16th.	1 $\frac{1}{10}$ oz.	17 oz.	1 $\frac{1}{8}$ in.
Photo	June 4th.	June 9th.	1 $\frac{9}{10}$ oz.	18 oz.	1 $\frac{1}{8}$ in.
Parry	June 6th.	June 7th.	2 $\frac{3}{10}$ oz.	24 oz.	1 $\frac{1}{8}$ in.
Pearl.....	June 4th.	June 7th.	2 $\frac{1}{10}$ oz.	24 oz.	1 $\frac{1}{8}$ in.
Sucker State.....	June 4th.	June 9th.	1 $\frac{1}{10}$ oz.	22 oz.	1 $\frac{1}{8}$ in.
Sharpless	June 11th.	June 11th.	3 oz.	28 $\frac{1}{2}$ oz.	1 $\frac{1}{8}$ in.
Truit's Surprise.....	June 6th.	June 9th.	1 $\frac{1}{2}$ oz.	22 oz.	1 $\frac{1}{8}$ in.
Warfield	June 4th.	June 6th.	1 $\frac{1}{2}$ oz.	20 $\frac{1}{2}$ oz.	1 $\frac{1}{8}$ in.

NOTES ON VARIETIES.

In accordance with previous custom, both old and new varieties are included in our lists. This is done not only to afford means of comparison, but to furnish facts concerning old sorts, which facts are quite as useful to many as information relating to new varieties.

Anna Forest.—In some respects this is a desirable variety for home use. It is not sufficiently productive for market purposes; besides, the fruit lacks somewhat in firmness, and the plants are subject to rust.

Belmont.—No more favorable report can be given of this variety than in former seasons. It has all the essentials of a good variety, except productiveness, but is almost sure to disappoint in the crop.

Bomba.—Fruited on fall-set plants only. The plants were very weak and made a poor growth, consequently wintered poorly, and bore a very light crop of imperfect berries. Plants set last spring have not made a satisfactory growth, although they are much better than those received last season. It is probably one of those varieties that require rich soil and high cultivation.

Bubach.—The most luxuriant in foliage of all varieties tested. It was, however, somewhat disappointing in fruit, the quantity seemingly being less than such plants ought to produce. The quality is rather poor, and towards the last of the season the berries do not make good appearance in the basket. On the whole, however, it is a re-

markable variety, and possesses sufficient good qualities to win for it a permanent place on the list of profitable market sorts. It can hardly take high rank for family purposes, but as a market variety it will prove to be valuable, and may be planted with safety by commercial growers. It ripens the main part of its crop rather late. It withstands drought well.

Crescent.—In most sections this is still regarded as the most profitable of the old varieties. It is the standard here both for productiveness and earliness.

Cumberland.—Too well known to require an extended notice. It can be recommended for private growers only, not being sufficiently productive for market purposes.

Covell.—This variety is about one picking earlier than the *Crescent*, and deserves trial by those who find early berries profitable. It will thrive on light soil, hence could be grown on gravelly or sandy southern exposures, where it would ripen nearly two weeks in advance of most varieties. It yields the bulk of its crop at two pickings, after which the berries are too small to be marketable, even with good cultivation. It is not a profitable market variety, except as indicated, or possibly for forcing.

Carmichael.—Plants set in spring of 1887 grew quite well, as did those set in 1888, but the former showed a decided falling off in vigor, even before the drought set in, hence produced very little fruit. It fared the worst by drought of any late sort on the grounds. A fair report cannot be given without further trial.

Crimson Cluster.—Not satisfactory here as to growth and productiveness, and can hardly become popular generally.

Gold.—Not so satisfactory as last season, as it was planted on less fertile soil. It requires high cultivation, which it will amply repay, but will fail on light soil where many other varieties succeed. In certain localities, and in the hands of good cultivators, it will doubtless prove profitable, but can hardly become a general favorite.

Gandy.—One of the best to withstand drought, of the late sorts, which was greatly in its favor the present season. In growth and healthfulness of foliage it is unsurpassed, although there is some doubt as to its productiveness. Should it prove to be sufficiently prolific it will surely take rank as a profitable market variety.

Haverland.—Fruited on fall-set plants only, from which it would not be safe to venture an opinion. There can be no doubt, however, as to health, vigor and productiveness of the plants. It seems to be fully as productive as the *Crescent*, and by some it is said to excel that variety in this particular. The berries are rather above medium size and quite uniform, not very firm nor of the very best quality, but no more defective in these particulars than the *Crescent*. Some of the berries on our plants were ill-shaped, showing that fertilization had been imperfect, and indicating that it requires a plentiful supply of pollen. *Crescents* in the same row were perfectly fertilized, as perfect flowering sorts were no more than a rod distant. The indications are that the *Haverland* will prove to be a formidable rival of the *Crescent*, and take rank as a profitable market variety, but will hardly become a favorite with amateurs.

Hoffman's.—Resembles the *Champion* or *Windsor Chief*, but the plants are rather more dwarf and the berries a trifle smaller. Not very desirable, although it has some good points.

Itasca.—All that can be desired as to productiveness and quality, but the berries are too small for it to become a profitable market variety.

Jewell.—Essentially the same may be said of this variety as in former reports. It will succeed only under favorable conditions, but responds readily to high cultivation. It sends out very few runners, and is especially well adapted to hill cultivation.

Jessie.—This variety has for three seasons given very satisfactory results here, on both fall and spring-set plants, and on several different kinds of soil. It does not yield as heavily as the *Crescent*, but does not fall far below, while the fruit would sell as high in market as that of any other variety, because of its fine appearance and good quality. Commercial growers can hardly fail to find profit in the *Jessie*, and it will

surely please amateurs. It is one of the best varieties for the family garden. Some unfavorable reports have been made concerning it, as many of the plants first sent out failed to grow, and it does not seem to be equally well adapted to all localities, being rather more restricted in range than the Bubach and Crescent. It is not far from the truth to say that it yields more first-class fruit than any other variety at the Station, but this locality cannot be taken as representing the whole State. Every grower ought to try it on his own soil, especially if he can sell choice berries at a premium, otherwise he may find more profit in the Crescent and Haverland.

Lida.—This can hardly become a general favorite, and yet it has some very good points, indicating that it may prove to be valuable in certain localities. The fruit is uniformly large and showy and of good quality. The plants are rather weak, and seemingly produce more berries than they can mature, yet as a matter of fact nearly all do mature in good condition. The variety ought to be tried by amateurs and such commercial growers as can give a little extra care in order to secure fine fruit.

Louise.—Not yet fruited here, but the plants are not making a satisfactory growth.

Logan.—Not fully tested, but seems to be variable. Many of the berries were quite large and fine, others were small and inferior. It seems to have many good points, but further trial is necessary in order to determine its true place.

Miner's Protégé.—This is not a new variety, but it is deserving of more extended trial than has been given it. It is particularly valuable for near market, and for family use.

May King.—This is now a well established early variety, and is a good companion for the Crescent. It was much less productive than usual here the past season, being considerably damaged by the drought. Its productiveness has doubtless been overrated and its earliness exaggerated, but it is nevertheless a valuable variety.

Mammoth.—The fruit is of large size and good quality, but thus far we have not been able to obtain it in sufficient quantity. It is doubtless better for amateurs than for commercial growers.

Monmouth.—Quite early, and may prove to be desirable, but has not shown sufficient vigor and productiveness here.

Norman.—No variety that has been tested here surpasses the Norman, when at its best. It requires high cultivation, and is more suitable for amateurs than for commercial growers.

Ontario.—It is scarcely possible to show wherein this variety differs from the Sharpless. At all events it fills the same place as the Sharpless, i. e., it is suitable for amateurs, and in a few localities is valuable for market.

Ohio.—Failed to ripen more than two pickings because of the drought. It can be recommended as a late market variety only, and should be given a moist, rich location, and if possible a northern exposure. Under such conditions it can hardly fail to give satisfactory returns, but on thin, light soils it may not prove to be profitable.

Parry.—From the same source as the Lida, and has much the same character of foliage, but not equally valuable. It is lacking in vigor, hence cannot be recommended for general planting.

Pearl.—This variety has fruited here but one season, and under adverse circumstances, but produced a crop that might be considered good in a favorable season, as it withstood the drought almost perfectly. The plants are healthy and productive, while the fruit, although not large, is above medium and very uniform in size and regular in outline, making a good appearance in the baskets. Further trial is necessary before speaking advisedly concerning it, but the indications are that it will be suitable for general planting. Commercial growers will do well to give it a trial.

Sunapee.—Plants quite productive, and fruit of good quality, but too small for market purposes. Cannot be recommended for any purpose.

True's Surprise.—Quite promising in growth and when in bloom, but very disappointing both in size and quantity of fruit. The first berries are fair in size, but scarcely any are marketable after the second picking.

Warfield.—This variety made a good growth in 1887, in spite of the dry weather, and gave promise of a heavy crop in the spring. It was one of the first to succumb to the drought, however. The first and second pickings were about as early and equal in quantity to the *Crescent*, but after that there was a decided falling off, and no berries of any account remained after the fourth picking, while the *Crescent* held out much longer. The fruit is of good color and makes a fine appearance in the baskets. It is rather soft, of medium size and not of high quality, but will sell well. On the whole, the *Warfield* is a promising variety, and is deserving of further trial. It will undoubtedly prove to be valuable in some localities.

TRIAL OF FERTILIZERS ON STRAWBERRIES.

In the spring of 1885, a piece of ground, considerably worn, was selected and planted with strawberries. The ground was laid off in plots 9 feet by 30 in size.

Plot No. 1 received no fertilizer.

"	"	3	"	superphosphate at the rate of 300 lbs. per acre.				
"	"	5	"	nitrate of soda	"	"	400	"
"	"	7	"	sulphate of potash	"	"	400	"
"	"	9	"	muriate	"	"	200	"

In addition to the above, other plots were treated with common salt, barn-yard manure, bone meal and sulphate of ammonia. The alternate plots were left unfertilized. In the springs of 1887 and 1888 Nos. 3, 5, 7 and 9 were again treated. Owing to dry weather and lack of care in applying the fertilizers many of the plants were lost, and a poor stand was secured in consequence. This necessitated replanting, hence samples for chemical analysis could not be secured in 1887. Samples from the five plots named were taken of the crop of 1888, and submitted for analysis to Prof. H. A. Weber, of the State University; the object being to ascertain the effect of the various fertilizers upon the quality of the fruit. The variety used was the *Crescent Seedling*.

The following is his report :

STRAWBERRIES.—TABLE II.—EFFECT OF FERTILIZERS UPON QUALITY.

Ingredients.	Plot Number.				
	1	3	5	7	9
Sugar (fruit).....	7.47	7.08	7.67	7.83	7.73
Free acid (malic)	1.35	1.09	1.31	1.13	1.24
Seed.....	1.10	1.02	1.00	1.09	1.01
Pectose, Protein, combined acids, etc.....	1.06	1.68	0.96	1.39	1.28
Fiber.....	0.28	0.26	0.30	0.28	0.29
Ash, exclusive of seeds.....	0.51	0.53	0.54	0.50	0.50
Water.....	88.33	88.34	88.22	87.78	87.95
Total.....	100.	100.	100.	100.	100.

It will be seen from the above analyses that the several samples were practically identical, and that the various fertilizers applied on the different plots had no effect in changing the composition of the fruit. So far as taste and appearance of the fruit were concerned, no difference could be detected in the samples from the several plots. In two other respects, however, there were decided differences. The fruit ripened several days earlier on the superphosphate plot than upon the nitrate of soda plot, and upon another plot where sulphate of ammonia was used the difference in time of ripening was still more marked, so much so that at the time the other plots were picked a sufficient quantity of fruit for picking could not be found on this plot. The difference in growth of the plants and color of foliage was also very marked. The plants on the superphosphate plot and unfertilized plots could hardly be distinguished; but those on the nitrate of soda plot were much stronger in growth and the foliage was of a darker green color than those named; while the extreme was still greater where sulphate of ammonia was applied. Potash seemed to have no appreciable effect on the growth and color of the foliage. It was also evident that while sulphate of ammonia and nitrate of soda promoted growth of foliage, they decreased the quantity of fruit.

Plots that were treated two seasons and not the third, showed no effect from the previous applications, except in the cases of bone and barnyard manure. The effect of the manure was greatest the first season in securing a good stand. Incidentally, it may be stated that the field was infested with white grubs. None of the substances applied, including salt, seemed to have the least effect in driving away the grubs, even when employed in sufficient quantities to kill the plants (this was done on some other plots to test the effect of fertilizers in repelling the white grub), hence the absurdity of the advice often given to apply salt in order to drive away the white grub. The plants on the plots where manure was applied grew more vigorously than any of the others and made more runners, and on these beds an almost perfect stand was secured.

The same series of experiments is in progress with raspberries and pears.

Several varieties of strawberries were also submitted to Professor Weber for analysis. Other varieties would have been analyzed but for the difficulty in securing fair samples on account of dry weather.

His report is as follows:

STRAWBERRIES.—TABLE III.—CHEMICAL ANALYSIS.

Constituents.	Miner.	Rubach.	Jewell.	Jessie.	Cumber- land.
Sugar (fruit).....	9.05	5.75	6.25	6.00	5.55
Free acid (malic).....	1.60	1.13	0.93	1.34	1.07
Seed.....	1.55	0.78	0.75	0.93	1.24
Pectose, Protein, combined acids, etc....	0.86	1.96	0.70	1.80	1.48
Fiber.....	0.42	0.35	0.26	0.35	0.27
Ash, exclusive of seeds.....	0.51	0.45	0.44	0.47	0.51
Water.....	86.01	89.58	90.67	89.11	89.88
Total.....	100.	100.	100.	100.	100.

The above named samples were taken during an extremely dry time, hence the per cent. of sugar is probably much higher than the average. This is confirmed by analysis made last season by the same authority. The amount of sugar found then in the Crescent was about 53 per cent. of that found the present season; the weather being very wet in 1887 when the samples were taken. The per cent. of acid was nearly the same both seasons. That is, the relative proportion of acid to sugar was nearly twice as high in wet weather as in dry weather.

It would, perhaps, not be safe to institute comparisons between varieties without a greater number of analyses. It is probable that the Cumberland would, on the average, show a higher per cent. of sugar, as the quantity of fruit from which to select samples was less than the others. The other samples, so far as known, represented fair averages.

If we take the analysis of the Crescent from the unfertilized plot, we find that it stands second, and next to the Miner in sugar, and occupies the same place with reference to acid. That the Crescent is high in acid will be doubted by no one, but that it is also comparatively high in sugar, some may find it hard to believe, and it will be equally surprising that the Jewell has less acid than the Jessie. A greater number of analyses might change these figures, but it should be remembered that the taste is not a sure guide in determining the proportions of sugar and acid, and that flavor may disguise either one or both. The Jessie has less sugar and about the same quantity of acid as the Crescent, but is much more palatable because of having higher flavor. The berries were all taken from mulched beds, and the per cent. of sugar is probably lower on that account.

It will be seen that there is quite a difference in the per cent. of seeds in the varieties named, but the per cent. in all is quite low in comparison with the wild strawberry. Professor Weber, in a paper before the Columbus Horticultural Society, in speaking of two varieties, says: " Accord-

ing to Fresenius, the wild strawberry contains six per cent. of seeds. The Crescent seedling was found to contain 1.52 per cent. seeds, and an unnamed seedling 1.50 per cent. seeds. In other words, the amount of seeds in these two cultivated varieties has been reduced 4.5 per cent., or 75 per cent. when compared with the seed content of the original wild berry."

This shows that the cultivated strawberry is superior to the wild as a food, and considering the additional fact that the ratio of acid to sugar is lower in the cultivated than in the wild berry, we may well be content to lose something in flavor for the sake of greater gains.

II. RASPBERRIES.

The season of 1888 was quite favorable for the raspberry crop, as an abundance of rain fell during the time of fruiting. Some of the early varieties were doubtless checked somewhat by previous dry weather, but as the cultivation had been thorough, they were not seriously damaged.

Both red and black varieties have been considerably damaged, on the grounds of the Station, by the raspberry blight. The birds have also been a source of annoyance, taking a large share of the crop of some of the early and late varieties, when berries were scarce. These causes detract somewhat from the value of the following report, and have rendered it impossible to make notes in such accurate detail as seemed desirable. Concerning some varieties there is nothing new to report, and the same remarks will apply as were made in bulletin 2, but for the benefit of those who may not have seen that bulletin, they are repeated.

Ada.—This is the second season that Ada has fruited here, and it has thus far been satisfactory, with the exception of showing a tendency to blight. As the blight is not troublesome in most other sections, and so far as known does not appear at all in those localities where the raspberry is most at home, there need be no fear on that score. In vigor and productiveness the Ada equals the Gregg, and perhaps excels it in the latter particular, and is about the same in season, continuing in bearing a little longer, if there is any difference. In fruit, the two varieties are similar, the Ada being a trifle the smaller. We have not been able to test its hardiness, but there can hardly be a doubt but it will prove satisfactory in that respect. Commercial growers will do well to give it a trial.

Carman.—Plants moderately vigorous, but quite prolific; fruit of medium size, of fine appearance and good quality. Season about the same, or a few days later than the Tyler. Although not fully tested, it does not give evidence of superiority to the Tyler or Souhegan, but it is without doubt a valuable variety.

Crimson Beauty.—The plants of this variety have not always passed the winter well here, and are shy bearers. It is, however, one of the earliest of the red varieties, and the fruit is large and beautiful. It is thought by some to be a profitable market sort, but does not sustain that reputation generally.

Cuthbert.—Although not a new variety, there seems to be much difference of opinion as to its value. It seems to succeed in some localities, but it has never given a crop here. It is, perhaps, the most unsatisfactory of all the red sorts.

Earhart.—Fruited here for the first time last season. The plants are vigorous and healthy, and apparently productive. It is probably one of the best of the everbearing sorts. The first crop this season was nearly equal to that of most other varieties, and there are still considerable numbers of unripe berries and blossoms.

Golden Queen.—So far this variety has proven to be all that has been claimed for it. The plants are hardy, vigorous, healthy and productive, while the fruit is beautiful in appearance and excellent in quality. It is an excellent variety for home use, and might be profitably grown for some markets.

Hansell.—Plants not perfectly hardy here and only moderately productive. Although quite early, it is much less profitable than the Turner, being but little earlier, and much less productive.

Hilborn.—This variety has thus far given entire satisfaction here, the plants being hardy, vigorous and productive, while the fruit is unsurpassed in appearance. It can hardly fail to take rank as one of the best second-early black caps. Another season's trial confirms what has been said of this variety in previous reports. Its uncommon vigor, productiveness and beauty of fruit commend it to the attention of fruit-growers generally.

Johnston's Sweet.—This is another good second-early black-cap, and is thought by some to excel all others in quality. It has shown no weakness here, except that the canes have been affected more than most other varieties by blight. It produced but little fruit the past season, owing to the blight. As stated concerning the Ada, this need cause no uneasiness to those living in more favored sections. It is a safe variety to try.

Marlboro.—There is still much difference of opinion as to the value of this variety. It does not rank as a prolific bearer here, and yet is valuable, as it uniformly gives a fair crop of very fine berries. It surely has sufficient merit to warrant further trial.

Nemaha.—Thus far this variety has not proven equal to the Gregg in productiveness and size of fruit. Not fully tested as to hardiness. Another season's trial shows that it is decidedly inferior to the Gregg in the above respects, the berries being about the size of the Ohio.

Rancocas.—Resembles the Hansell, and the remarks concerning that variety will hold good for both in most respects.

Reliance.—Although not new, this variety is but little known, and not so well appreciated as it deserves. Its hardiness, productiveness and size of fruit place it among the foremost in point of profit as a market variety. The berries have, the past season, shown more tendency to crumble than formerly, which detracts greatly from their appearance in the baskets.

Shaffer.—This variety is deservedly popular for home use, and in some localities for market. It is unequalled for canning purposes.

Springfield.—Former reports on this variety have been unfavorable, but the plants seem to improve in productiveness with age. It evidently requires good treatment, and should be planted on rich soil. In sections where very early raspberries bring a high price it might prove to be profitable, as it yields the bulk of its crop before most other varieties have fairly begun to ripen. The berries are small, but make a good appearance in the baskets.

Tyler (Souhegan).—The most reliable and profitable of early black caps. The fruit is small, and not of high quality, but sells at good prices because of its earliness. It has been reported as having a tendency to rust in some localities, but it has not exhibited that weakness here, and it is a matter of doubt if those so reporting it have it true to name.

Turner.—Among the red varieties the Turner is still the standard for earliness and productiveness. It may not show the first ripe berries, but it will yield a good picking at an earlier date than any red sort thus far tested, with the possible exception of Highland Hardy. If the bushes are closely pruned, in the spring, the fruit is sufficiently firm

for near market. It gives greater profit than any other red variety on the Station grounds. It has, however, suffered greatly the last two seasons from the blight, and an old plantation seems likely to be ruined from that cause.

ANALYSIS OF RASPBERRIES.

Six varieties were submitted to Prof. Weber for analysis, and the following report is given :

RASPBERRIES.—TABLE I.—CHEMICAL ANALYSIS.

Constituents.	Reliance.	Shaffer.	Ohio.	Hilborn.	Ada.	Gregg.
Sugar.....	1.78	2.29	2.38	2.3	2.52	2.82
Acid.....	.92	.69	.68	.84	.76	.64
Seed.....	3.5	2.67	7.2	5.24	4.44	5.61
Pectose, Protein, combined acids, etc.....	3.92	6.08	4.75	5.71	6.53	5.91
Ash.....	.43	.30	.42	.40	.45	.42
Fiber.....	.32	.36	.59	.51	.49	.48
Water.....	89.13	87.60	83.98	85.00	84.80	84.12
Total.....	100.	100.	100.	100.	100.	100.

The most interesting fact to practical men, brought out by the above analyses, is that certain varieties are much better adapted to drying than others. The Ohio plainly takes the lead, having more than 16 per cent. of solid matter, but the Ada, Hilborn and Gregg fall but little below it, while the Shaffer takes much higher rank than commonly supposed. From the consumers' standpoint, however, the Ohio is decidedly inferior to all others, containing, as it does, a very high per cent. of seeds—almost half of its solid matter. It is probable that as ordinarily dried, or evaporated, about one-third of the total product is seeds, in case of the Ohio, which puts its food value very low and renders it a costly variety for the consumer to buy. The Gregg, Hilborn and Ada stand much higher, the latter excelling the Ohio in actual value by about 16 per cent. The Shaffer yields but little less profit to the grower, and is decidedly superior to any on the list, in the dried state, to the consumer.

The following table shows approximately the average product of dried fruit per bushel, as determined by experiments here and elsewhere, also the weight of seeds in that quantity of ordinary evaporated fruit. These weights, of course, vary considerably as the season happens to be wet or dry, but the comparison between varieties will hold the same in all cases.

RASPBERRIES.—TABLE II.—PRODUCT OF DRIED FRUIT.

Variety.	Average product of dried fruit per bushel of berries.	One bushel of berries contains of seeds about—	One bushel of berries contains of valuable food constituents about—
Ohio.....	9 pounds.	2.9 pounds.	3.4 pounds.
Gregg.....	8½ "	2.2 "	3.9 "
Hilborn.....	8½ "	2.1 "	3.7 "
Ada.....	8½ "	1.8 "	4.1 "
*Tyler.....	8½ "	2.4 "	3.3 "
Shaffer.....	8 "	1.0 "	3.8 "
*Hansell.....	.....	2.4 "	2.5 "
*Turner.....	.....	2.1 "	3.7 "
Reliance.....	.....	1.4 "	2.7 "

*Analysis made in 1887 by Prof. Weber. Weather very dry.

III.—BLACKBERRIES.

The first essential of a variety of blackberry in this climate is hardiness. The past winter was comparatively mild, but half hardy varieties sustained greater injury than in some more severe winters. This was probably due to the dry weather in 1887, which so enfeebled the plants as to greatly lessen their power to resist cold.

The estimates of hardiness given below will for this reason doubtless need revision. The lowest degree of cold during the winter was 8 degrees below zero. In 1887 the lowest point reached was 12 degrees below zero.

Ancient Briton.—Not perfectly hardy, but is without doubt sufficiently so to make it a safe variety to plant in any part of the State. The plants are vigorous, healthy and productive. The berries are of medium size, or a little larger than the Snyder, and of fair quality. It is a little later in ripening than the Snyder.

Agawam.—About the same in time of ripening as Ancient Briton, or perhaps a few days later. The two varieties are about equally hardy and prolific, and so far as tested there seems to be but little choice between them.

Bonanza.—Not fully tested, but seems to be quite tender, as it has suffered more or less even in mild winters. It has never given a crop here.

Erie.—This variety is about as hardy as the Lawton here. It was considerably injured last winter, and bore only a partial crop the present season. The berries are quite large and showy, and where it proves to be hardy, it will be a valuable variety.

Early Harvest.—This variety may be classed as nearly hardy in this latitude, and will yield a crop in all except unusually severe seasons. The berries are small—not larger than wild berries, but very uniform in size and beautiful in appearance. It is the earliest variety tested, coming at about the same time as the Gregg raspberry, which renders it less objectionable. In some markets this would prove to be a valuable variety, but is not adapted to general cultivation.

Early King.—A few days later and considerably larger than the preceding, but not equally hardy. In some sections this would prove to be a valuable early market variety, but it is not sufficiently hardy for general cultivation.

Minnewaski.—On its native soil this is a hardy variety, but it has not passed the winters here unharmed. It will probably rank about with the Lawton in hardiness, but it has not been sufficiently tested to make it possible to speak advisedly on this point. In some sections this will prove to be a valuable variety, because of its productiveness and large, showy fruit.

Nevada.—Quite tender, hence of no value here.

Snyder.—The hardest variety tested, and is valuable chiefly on that account. It has a tendency to overbear, and if allowed to do so, the berries are quite small. If pruned quite closely in the spring the fruit is much improved in size and texture. In many sections the Snyder can be grown with profit, but it would hardly be found desirable where wild blackberries are abundant.

Taylor.—Not equal to the Snyder in hardiness nor in productiveness, although the fruit is rather larger. For this locality it is hardly equal in value to Ancient Briton or Agawam.

Wilson, Jr.—Too tender to be of any value in this latitude, as it kills nearly to the ground every winter. The nature of its growth indicates that it could be easily protected by covering with soil. Its large size of fruit and productiveness make it a valuable variety where it can be grown.

Lucretia Dewberry.—This uniformly gives a crop of fine, large berries, which ripen with Early Harvest, or a few days later. The berries are difficult to pick and of rather poor quality, except when fully ripe, and at that stage are too soft for shipment. The above defects detract from its value, but it can still hold a place alongside our best blackberries. It can have but little value in sections where the best varieties of blackberries are hardy, but it is surely deserving of a place on our lists in this latitude.

Hardy Dewberry.—Not fully tested, but the plants are quite hardy and prolific. On young plants the berries are somewhat lacking in size, but are said to improve in this particular as the plants attain age. There seems to be no reason to doubt its hardiness.

Mr. O. W. Aldrich, an amateur grower, living about four miles north of the Station grounds, has kindly furnished the following report, showing the comparative hardiness of varieties of blackberries on his grounds.

Killed to the ground, *Texas Early*.

Seriously injured, *Wilson's Early*, *Needham's White*, *Sable Queen*, *Stayman's Early*, *Wilson Junior*, *Crystal White*, *Early Cluster*, *Kittatinny*, *Nevada*, *Hoag's Seedling*, *Topsy*.

Considerably injured, *Lawton*, *Minnewaski*, *Erie*, *Parish Pink*, *Dorchester*, *Bonanza*, *Dehring's Early*.

Not hurt for fruiting, *Agawam*, *Ancient Briton*, *Duncan Falls*, *Early King*, *Sadie*, *Snyder*, *Freed*, *Taylor*, *Hoosier*, *Wallace*, *Lincoln*, *McCracken*, *Newman's Thornless*, *Western Triumph*, *Wachusett*, *Warren*, *Mo. Mammoth*.

IV. SUMMARY OF SMALL FRUIT EXPERIMENTS.

STRAWBERRIES.

Varieties.—From tests thus far made on the Station grounds, we recommend as worthy of trial, among the newer sorts, for market purposes, Bubach, Gandy, Haverland, Jessie, Ohio and Pearl. The following possess points that make them desirable for amateurs: Anna Forest, Covell, Gold, Jewell, Lida, Norman and Ontario. The following are either undesirable or doubtful, and require further trial: Warfield, Mammoth, Mon-

mouth, Belmont, Parry, Truit's Surprise, Bomba, Carmichael, Hoffman's, Itasca, Logan, Louise, Sunapee.

Effect of fertilizers.—In our experiments different fertilizers have had apparently no effect upon the quality of the fruit. Fertilizers containing nitrogen have reduced the quantity of fruit, at the same time promoting the growth of foliage.

Quality.—Chemical analysis exhibits considerable variation in the percentage of sugar and acid in the different varieties, but there seems to be no direct relationship between this percentage and the quality of the fruit. In other words, flavor seems to be a more important factor in determining the palatableness of the fruit than either sweetness or acidity.

RASPBERRIES.

Varieties.—Of the newer varieties, Ada, Golden Queen, Hilborn, and Tyler are recommended as worthy of trial. The following are still in doubt and need further trial: Marlboro, Johnston's Sweet and Rancocas. The Crimson Beauty, Cuthbert, Hansell and Nemaha have not proved satisfactory on the Station grounds.

Quality.—As with strawberries, so with raspberries, chemical analysis fails to reveal the secret of palatableness. Incidentally, however, it shows that the relative proportion of seeds becomes, in some cases, an important factor in judging the relative merits of different varieties.

BLACKBERRIES.

For general planting in Ohio is recommended, of the varieties thus far tested at the Station, the Ancient Briton, Agawam, Snyder and Lucretia Dewberry. The Erie, Early Harvest and Minnewaski are worthy of trial. Wilson Junior, Nevada, Topsy, Bonanza and Early King are too tender for this latitude.

V. POTATOES.

The list of varieties on trial included 175 named sorts and a number of seedlings, some of which were sent for trial by the originators, but the greater number were of our own growing. It is not thought best to report upon these seedlings, as they are not of public interest until offered for sale. Out of a large number that originated here, only one is considered to be of any value, and further trial is to be given it before it is offered to the public.

Many of the named varieties have been on trial several seasons, and their value pretty well determined. The majority of these may be discarded, or retained only for comparison. The practical grower will, however, find but very few in the whole list that are worth planting. A special effort has been made to learn what varieties are best suited for

general planting, both of the new and of the old. Several varieties have been sent out for trial in various parts of the State, and some of these trials give valuable evidence concerning the varieties tested. The most important parts of our own work have been duplicated. All of the leading varieties, both new and old, have been grown in considerable quantities, so as to avoid the uncertainties and errors of small plot work.

POTATOES.—TABLE I.—COMPARISONS OF VARIETIES.

Name of variety.	Season.	Total yield, bus. pr. acre.
Arizona Beauty	Medium	106
Burbank	Medium	191
Boley's Northern Spy.....	Medium	187
Bonanza	Medium	191
Crown Jewel	Early	238
Cream of the Field.....	Medium	267
Chas. Downing	Early	178
Charter Oak	Medium	228
Colvin's Excelsior.....	Medium	247
Delaware.....	Medium	225
Eureka.....	Medium	268
Early Thoroughbred.....	Early	165
Early Eclipse	Early	243
Early Albino.....	Early	241
Early Oxford.....	Early	267
Early Ohio	Early	184
Early Standard.....	Early	218
Early Rose.....	Early	237
Early Howard.....	Early	260
Early Ontario.....	Early	181
Early Peruvian.....	Early	310
Empire State.....	Medium.....	270
Everitt.....	Early	253
Gold Flesh.....	Medium.....	77
Green Mountain.....	Late	242
Halo of Dakota	Medium.....	235
Lee's Favorite.....	Early	240
Monroe Co. Prize.....	Medium.....	128
Nott's Victor.....	Early	282
New Queen.....	Early	238
New York State.....	Medium.....	246
Ohio Junior.....	Early	204
Puritan.....	Early	278
Potentate.....	Medium.....	265
Pearl of Savoy	Early	241
Perfect Peachblow.....	Medium.....	143
Polaris	Early	273
Rural New Yorker No. 2..	Medium	206
Summit.....	Medium	307
Sunlit Star.....	Early	214
Stray Beauty.....	Early	181
Thorburn.....	Early	257
Vergennes.....	Medium	269
Vanguard	Early	247
Victory.....	Early	231
White Early Ohio.....	Early	231
White Elephant.....	Medium	272

The soil was a clay loam, well enriched with stable manure and superphosphate. The season was very favorable. The potatoes were cut to two eyes and planted 1x3 feet apart.

Table I includes all the varieties that are of special interest at present. The plots varied in size somewhat, hence the rate of yield per acre is given so as to make comparison possible. Fractions of bushels are omitted.

Of the varieties named in the foregoing table the following are of special interest, because of recent introduction and not fully tested: Boley's Northern Spy, Crown Jewel, Chas. Downing, Delaware, Early Thoroughbred, Early Albino, Early Oxford, Early Standard, Early Ontario, Early Peruvian, Gold Flesh, Monroe Co. Prize, Ohio Junior, Polaris, Puritan, Rural New Yorker No. 2, Summit, White Early Ohio.

Nearly all of the above were sent out for trial to different parts of the State. Reports were received from all except two lots of seed, one report being lost in the mail. Two reports could not be used because of evident mistakes in their preparation. A few varieties were sent to all, but in two cases the list was extended by the addition of varieties of which we had but a small quantity of seed. In each case the parties making the trial were requested to include one or more old varieties in the experiment for comparison.

It will be seen that the yields vary considerably, and that some varieties show a greater variation than others. A few varieties stand at the head of the list in nearly every case, while others quite as often are at the bottom. Particular attention will be called to these cases in the summary.

The yields at the Station are given alongside the reported yields from other sections, not for the purpose of showing where the largest yields were obtained, but in order to compare the relative standing of the varieties named. It should be borne in mind that the value of any variety is not shown by the yields it gives in several localities, as compared with each other, but as compared with other varieties. Whether a variety yields 100 or 1000 bushels per acre signifies nothing unless comparisons are made with other varieties under the same treatment. Following are the reports of those who have co-operated with the Station in these tests:

REPORT FROM T. B. TERRY, SUMMIT COUNTY.

Soil a strong loam, with a subsoil somewhat heavier, but not quite heavy enough to need tile drainage; in wheat, 1886; clover, 1887; plowed eight inches deep in April; harrowed once with loaded Thomas harrow and then rolled; fertilizer—fifteen Kemp's manure spreader loads per

acre of stable manure, with the liquid manure all saved by tight floors, and kept under cover until applied; spread broadcast before plowing.

Potatoes were cut to two eyes and planted in drills thirty-two inches apart with the Aspinwall planter, the pieces a foot or little more apart; level cultivation, or nearly so, was given.

POTATOES.—TABLE II.—COMPARISON OF VARIETIES BY T. B. TERRY.

Name of variety.	Rate of yield bushels per acre.		
	At Mr. Terry's.	At the Station.	Average.
Chas. Downing.....	305	178	241
Lee's Favorite.....	317	240	278
Puritan.....	305	278	291
Early Standard.....	211	218	214
Early Albino.....	200	241	220
Ohio Junior.....	200	204	202

Mr. Terry reports the Beauty of Hebron as yielding better than any of the above, but the seed, which was obtained from Maine, was much superior to that of the varieties sent from the Station. He says: "We shall continue to plant Hebrons in preference to any of these kinds. Lee's Favorite would be second-choice." It will be seen that the relative position of the varieties is not the same in the two columns, but in the case of the Chas. Downing our seed was not as good as that sent Mr. Terry. The yield of the Ohio Junior was comparatively low in both cases, and the average was also low. Lee's Favorite and Puritan take the lead in average yield.

REPORT FROM A. SHIRER, MONTGOMERY COUNTY.

Soil, sandy loam with clay subsoil; had been cropped with strawberries and garden vegetables since 1877, with two dressings of stable manure during the period; plowed in the fall and again in the spring, six inches deep; manure plowed under in the fall, and 150 bushels per acre of unleached hardwood ashes spread broadcast in the spring; potatoes cut to two eyes and planted in hills 2½ feet apart each way, two pieces to the hill; cultivation level, or nearly so; weather very dry during June.

POTATOES.—TABLE III.—COMPARISON OF VARIETIES BY A. SHIRER.

Name of variety.	Rate of yield—bushels per acre.		
	At Mr. Shirer's.	At the Station.	Average.
Summit.....	163	307	235
Green Mountain.....	124	242	183
Early Ohio.....	107	184	145
Early Standard.....	108	218	168
Puritan.....	131	278	204
Ohio Junior.....	90	204	147
Lee's Favorite.....	93	240	166
Early Rose.....	114	237	175
Early Albino.....	112	241	176

The Summit stands at the head in both lists, and also averages the highest. Comparing the Ohio Junior with the varieties tested by Mr. Terry, it stands at the foot of the list. The average of Ohio Junior and Early Ohio is about the same. The low average of Lee's Favorite can not be explained.

REPORT FROM E. C. GREEN, MEDINA COUNTY.

Soil, clay loam, naturally quite well drained; previous crop, corn on timothy sod; plowed in the spring, eight inches deep; no fertilizers used; potatoes cut to two eyes and planted in drills 1 foot by 3; level cultivation given; all varieties blighted, which doubtless reduced the yield considerably.

POTATOES.—TABLE IV.—COMPARISON OF VARIETIES BY E. C. GREEN.

Name of variety.	Rate of yield—bushels per acre.		
	At Mr. Green's.	At the Station.	Average.
Puritan.....	136	278	207
Early Standard.....	85	218	151
Ohio Junior.....	61	204	132
Charles Downing.....	121	178	149
Early Oxford.....	162	267	214
Early Thoroughbred.....	116	165	140
White Early Ohio.....	95	231	163
Crown Jewel.....	112	238	175
Summit.....	182	307	244
Empire State.....	160	270	215
Perfect Peachblow.....	91	143	117

The Summit stands at the head in this list as in Mr. Shirer's, while Empire State and Early Oxford fall but little below the Summit. Comparing Ohio Junior with the same varieties as before, it stands at the bottom of the list.

REPORT FROM WILSON DRESBACH, PICKAWAY COUNTY.

Soil, clay loam; natural drainage good; clover sod, plowed in the spring; no fertilizer used, except a light top dressing of barn-yard manure; potatoes cut to two eyes and planted in drills 1x3 feet apart; level cultivation was given; the potatoes were not planted early enough in the season to secure the best results in that locality.

POTATOES.—TABLE V.—COMPARISON OF VARIETIES BY W. DRESBACH.

Name of variety.	Rate of yield—bushels per acre.		
	At Mr. Dresbach's.	At the Station.	Average.
Puritan.....	91	278	184
Early Standard.....	95	218	156
Ohio Junior.....	53	204	128
Charles Downing.....	82	178	130
Green Mountain.....	113	242	177
Monroe County Prize.....	141	128	134
Early Oxford.....	172	267	224
Crown Jewel.....	84	238	161
Summit.....	142	307	224
Empire State.....	172	270	221
Early Ohio.....	100	184	142

As in other cases, Summit, Empire State and Early Oxford stand at the head of the list. Comparing with the same varieties as before, the Ohio Junior is lowest in yield.

REPORT FROM N. B. COWLES, ASHTABULA COUNTY.

Soil, clay loam with clay subsoil, and surface drainage; cropped with corn the previous season; plowed in fall of 1887, and cultivated in spring with two-horse cultivator before planting; no fertilizer used; potatoes cut to two eyes, and planted 1½ feet by 3½ feet apart; cultivated twice with cultivator and once with shovel-plow.

POTATOES.—TABLE VI.—COMPARISON OF VARIETIES BY N. B. COWLES.

Name of variety.	Rate of yield—bushels per acre.		
	At Mr. Cowles.	At the Station.	Average.
Lee's Favorite.....	138	240	189
Puritan.....	161	278	219
Early Albino.....	144	241	192
Summit.....	281	307	294
Empire State.....	336	270	303
Early Ohio.....	135	184	159
Potentate.....	208	265	236
Pearl of Savoy.....	172	241	206

The Empire State and Summit again stand at the head of the list; there being but little difference between them as in most other cases.

REPORT FROM M. CRAWFORD, SUMMIT COUNTY.

Soil, clay loam, in good condition; in strawberries in 1887; potatoes cut to two eyes, and planted 18 inches by 3 feet apart; 500 pounds of superphosphate per acre was applied in the hills; dug before maturity on account of the blight.

POTATOES.—TABLE VII.—COMPARISON OF VARIETIES BY M. CRAWFORD.

Name of variety.	Rate of yield—bushels per acre.		
	At Mr. Crawford's	At the Station.	Average.
Puritan.....	215	278	246
Early Standard.....	178	218	198
Ohio Junior.....	192	204	198
Green Mountain.....	202	242	222
Monroe County Prize.....	300	128	214
Perfect Peachblow.....	262	143	202
Pearl of Savoy.....	293	241	267
Potentate.....	242	265	253
Gold Flesh.....	220	77	148

In the above there are two marked variations in Monroe Co. Prize and Gold Flesh; the former standing at the head of Mr. Crawford's list, and seventh in the Station list, while Gold Flesh is at the foot in the Station list and the fifth in Mr. Crawford's. The only explanation that can be given is that Mr. Crawford's soil or treatment is better suited to these varieties than the soil or treatment at the Station.

REPORT FROM H. MILLER, PICKAWAY COUNTY.

Soil, black loam, with clay subsoil, with fairly good, natural drainage; previous crops, garden vegetables; plowed six inches deep in the spring, and put in fair condition for the crop; fertilizer, hardwood ashes, applied in the drill; potatoes cut to two eyes and planted in drills 1 foot by 3 apart. Level cultivation was given.

POTATOES.—TABLE VIII.—COMPARISON OF VARIETIES BY H. MILLER.

Name of variety.	Rate of yield—bushels per acre.		
	At Mr. Miller's.	At the Station.	Average.
Lee's Favorite.....	335	240	287
Early Standard.....	214	218	216
Early Albino.....	182	241	211
Pearl of Savoy.....	325	241	282
Potentate.....	287	265	276
Summit.....	245	307	276
Early Ohio.....	162	184	173

The above report differs from the others in the low yield of the Summit, while Lee's Favorite and Pearl of Savoy rank higher than in most cases.

SUMMARY.

It is evident that comparisons cannot be made throughout in the above lists, as all varieties were not included in each, owing to causes beyond control. Taking the early white varieties of the Snowflake class, viz.: Puritan, Early Standard, Early Albino and Charles Downing, we find the average for each as follows: Puritan, 238; Charles Downing, 185; Early Standard, 179, and Early Albino, 151 bushels per acre. In five trials where the two were planted together the yield of the Puritan was greater than the Charles Downing in every case. The Puritan gave an average of 188 bushels per acre, and the Charles Downing 152 in the five trials. In six trials of Puritan and Early Standard, the former took the lead in every case but one. The average is as follows: Puritan, 192, and Early Standard, 149 bushels per acre. In four trials the Puritan excelled the Early Albino in each case, and gave an average of 218 bushels per acre, while the latter averaged 174 bushels per acre. Thus it appears that the Puritan excels all others of its class in productiveness. The Polaris, however, in tests made at the Station, seems to rank about as high as the Puritan. Comparing Puritan and Lee's Favorite, the former gave higher

yields in four cases out of five, the average being 193 bushels per acre for Puritan and 171 for Lee's Favorite; the difference not being very marked.

Early Oxford excelled the Puritan in two cases out of three, and gave an average of 200 bushels per acre, and the Puritan 168 in the three trials.

Ohio Junior gave lower yields in nearly all cases than any other early variety. Comparison by averages shows that it is the least productive of early varieties, except Early Ohio, the two being about equal. As compared with Early Oxford it stands as 106 to 200 in three trials.

Empire State and Summit stand first and second, averaging 234 and 228 bushels per acre, respectively, in four trials, while Puritan, under the same conditions, averaged 166 bushels. Summit, Empire State and Early Oxford average very nearly the same in three trials.

Taking the evidence of these trials we may rank the varieties in the following order in respect to productiveness: Empire State, Summit, Early Oxford, Pearl of Savoy, Potentate, Puritan, Lee's Favorite, Early Rose, Charles Downing, Early Standard, Early Albino, Early Ohio and Ohio Junior. The difference between any two consecutive varieties is so little that further trials might change the order somewhat, hence it signifies nothing whether a variety is third or fifth on the list. Since the ratio of productiveness between the lowest and the highest is as 1 to 2, it is probable that the relation is very nearly expressed. It is not possible from the data at hand to say how such varieties as Crown Jewel, White Early Ohio, Monroe Co. Prize and Early Thoroughbred rank as to productiveness. Monroe Co. Prize probably stands very near the head of the list, while the others are scarcely above medium. If the order of the above list were reversed the varieties named would rank in the order of earliness, with the exception that outside of the extremes there would be but little difference in time of ripening, Ohio Junior and Early Ohio ripening at about the same time, and being without question ahead of all others. Summit and Empire State are about three weeks later than Early Ohio. The remaining varieties ripen from a week to ten days later than Early Ohio, and all at very nearly the same time.

NOTES ON VARIETIES.

The design in these notes is to bring together the most important facts concerning both new and old varieties, in order that the inexperienced in potato growing, as well as experts, may judge what kinds to plant. Some old varieties are included for comparison, also for the purpose of calling attention to the fact that they are not superseded by the highly praised new sorts. The effort has been made to shorten the list as much as possible, and in doing so it is probable that some worthy

varieties have been excluded, but it is better to omit a few than to include too many. It seems necessary to at least mention all of the newer varieties, in order to call attention to their defects as well as their merits.

Boley's Northern Spy.—Tubers rather long, flattened, irregular in shape and size; eyes shallow; pink or rose-color. This variety has been tested here one season only, and was sent out for trial in but two other sections, hence a satisfactory report concerning it cannot be given. The tubers received from Samuel Wilson were far from being satisfactory in appearance, having a rough, coarse outline, that rendered them quite unattractive. Those of our own growing are no better, a large per cent. being ill-shaped and unmarketable. As compared with Summit and Early Oxford, next to which it was grown, it yielded about two-thirds the rate of those varieties. Further trial is necessary before speaking more confidently, but last season's test indicates that it has but little merit.

Crown Jewel.—Tubers of medium length, nearly cylindrical, eyes shallow, skin white. In appearance this potato equals any of the Snowflake class. It was sent out for trial in two localities, and judging from reports received of these trials it may be ranked with Charles Downing and Early Albino as to productiveness and earliness. It does not seem to surpass these varieties in any particular, except, possibly, in being rather more uniform in size and more beautiful in appearance.

Charles Downing.—Differs from Crown Jewel in being somewhat flattened. It seems to have declined somewhat in vigor since its introduction. The yield was comparatively light last season, and many of the tubers were below marketable size. It can hardly retain the high rank given it at first, because the Puritan is evidently its superior in productiveness, although not in earliness or quality.

Delaware.—Tubers of medium length, usually flattened, eyes shallow; skin white, slightly russeted. We were not able to have this variety tested in other localities, but it was very satisfactory here. It is medium in season, and apparently very productive. The tubers are rather above medium size, and perhaps too large for family use; in some markets they would not sell as well as potatoes of smaller size. Further trial is necessary before giving a more decided opinion as to its merits.

Early Thoroughbred.—Tubers of medium length; flattened; rather irregular in shape; eyes shallow; skin pink. Not fully tested, but seems to be rather unproductive. It is quite early, ranking about with Early Ohio, and perhaps equaling that variety in other respects. Nothing more definite can be said concerning it at present.

Early Albino.—Tubers of medium length; usually cylindrical, but often slightly flattened, eyes shallow; skin white. This variety did not rank as high in yield as in former seasons, but was quite satisfactory. The tubers are very uniform in size, beautiful in appearance and excellent in quality. Wherever it was sent out for trial the past season, it gave satisfaction, and received high praise from several sources. It must be ranked as one of the standard early white varieties.

Early Standard.—Very similar to the above, except that the tubers are usually a little flattened. If there is any choice between the Early Standard and the Early Albino, it is in favor of the latter, as being rather more regular and showy. In most particulars they rank about equal.

Early Oxford.—Tubers of medium length, slightly flattened, eyes shallow; skin pink or rose color. Not fully tested, but has been very satisfactory thus far. It may be described as a rejuvenated Early Rose, as it resembles that variety and is much more prolific.

Empire State.—Tubers rather long; usually cylindrical; eyes shallow; skin white. This variety has not been uniformly satisfactory here, but the past season it was one of the best. In most localities it is regarded favorably, and in some sections it is thought to be the best medium, or second early variety, known. It is a vigorous grower, and

should have more room than the early varieties. Those who wish to plant second early varieties, should not overlook the Empire State.

Lee's Favorite.—Tubers of medium length; slightly flattened; eyes shallow; skin light pink. The record of this variety is as good as any of its class. The past season it has not done quite as well as usual, as the seed used was not of the best quality. It is not quite as early as Early Ohio, but ripens at about the same time as Early Rose. It is much more productive than either, however; perhaps nearly equaling Early Oxford and Empire State in this particular. It must be ranked with the best of the thoroughly tested early varieties.

Monroe County Prize.—Tubers medium in length; too long; usually flattened; often tapering; eyes shallow; skin white. The tubers vary considerable in size and shape, and do not present a very inviting appearance. The yield here was quite light, but was good with Mr. Crawford. The vines make a strong growth, about equal to Empire State. It is doubtful, however, if it is equal to that variety in productiveness. Further trial is necessary before speaking advisedly as to its value.

Ohio Junior.—Tubers of medium length, nearly cylindrical; eyes shallow; skin pink. Resembles the Early Ohio in every particular. In what respect it is superior to that variety does not appear. It ranks about the same in productiveness and earliness. The tubers are quite as subject to the scab as the Early Ohio, and do not excel in size or general appearance. It seems, in fact, to be an almost exact reproduction of the Early Ohio, and so far as can be seen, is no improvement upon that variety.

Puritan.—Tubers medium length, slightly flattened; skin white. In general appearance this variety is similar to Early Albino. It seems to be rather more productive than that variety, and equal to it in other respects. Further trial is needed to confirm the results obtained last season; meanwhile the Puritan must be ranked as the best of the Snowflake class.

Polaris.—Differs from the Puritan in being rather longer. In other respects they are essentially the same. Whether Polaris is equal to Puritan in productiveness remains to be shown by further trial.

Rural New Yorker, No. 2.—Tubers of medium length; flattened; eyes few and shallow; skin white. We received one tuber for trial, and the result seems to indicate that it is a valuable variety, but further trial with larger quantities is necessary before passing judgment. The vines make a strong growth, and the tubers are very uniform and beautiful in appearance. It is second early in season.

Summit.—Tubers rather long; slightly flattened; eyes large but not deep; skin pink. This variety has given excellent results here and wherever sent for trial. The vines are strong and healthy, resisting bugs and drouth to a great degree. It is one of the most reliable croppers on our list. Some complaint has been made, however, by those to whom it has been sent for trial, that the tubers are often ill-shaped, and that fault was manifested here to some extent. It is excelled by many other varieties in appearance of tubers, but by none that we have tested for the last two seasons in yield and reliability. It can be recommended as a safe variety for general planting.

Victory.—Tubers rather long; slightly flattened; eyes of medium depth; skin pink. This is a very valuable variety of the Early Rose type, being productive, while the tubers are uniform in size and present a fine appearance. Not so generally grown as it should be.

DRYING OF SEED.

Tubers of several varieties were cut and laid away to dry for different periods of time before planting. One lot was cut 12 days before planting; another 9 days; another 5 days; while the last lot was cut and planted the same day. The planting was all done on the same day, May 5.

The table gives the rate of yield per hundred hills; fractions omitted.

POTATOES.—TABLE IX.—EFFECT OF DRYING SEED AFTER CUTTING.

Variety.	Total product of 100 hills from seed—			
	Cut and planted same day.	Cut five days before planting.	Cut nine days before planting.	Cut 12 days before planting.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Victory.....	67	75	92	69
Parson's Prolific.....	67	76	101	102
Winslow's Seedling.....	86	70	106	67

Drying for five days seems to have been slightly beneficial in two cases and injurious in a third. The effect of nine days' drying appears to have increased the productive capacity in all cases, while twelve days' drying resulted in injury in two cases, as compared with nine days' drying, and seemed to have no effect in a third. Further trials are necessary before it can be set down as a fact that a certain amount of drying is either beneficial or injurious. The conclusions of Mr. Goff, of the New York Experiment Station, after conducting a similar experiment, are "that exposing cuttings to the air of a moderately dry room for a week or ten days before planting is neither detrimental to their vegetation nor productiveness, while the tendency may be toward a slight increase in yield. A longer exposure than ten days, however, is injurious."

REPORT OF THE ENTOMOLOGIST.

LETTER OF SUBMITTAL.

SIR: I have the honor to submit herewith a report of the operations of the Division of Entomology of this Station for the nine months now ending. The work has naturally fallen into two lines, viz.: (1) the investigation of the life histories of and remedies for the noxious insects of Ohio, and (2) the dissemination of entomological information among those standing in practical need of it. Assuming that the organic laws under which this Station operates intended that it should promote in every possible way the agricultural interests of Ohio, I have felt it to be a legitimate part of my work to disseminate information concerning insect ravages whenever and wherever there appeared to be a demand for it, even though such information was already before a portion of the agricultural public.

As an introduction to the report I have prepared an entomological calendar for the season, aiming especially to indicate therein the abundance and injury of the more important noxious insects, and also to include notes upon the principal investigational results attained during the season in the work of the Division.

In the part following I have included such contributions to a knowledge of the life-habits of the noxious insects of Ohio, and of the methods of preventing their injuries, as have been made during the season. The longest and perhaps the most important article of this series is that discussing some elaborate experiments with remedies for the Plum Curculio, which apparently point to the conclusion that this pest may be held in check by the method so generally in use among orchardists for preventing the ravages of the codling moth or apple worm—that of spraying the trees early in the season with the arsenites, Paris green or London purple. In the second article are recorded some important experiments in keeping at bay the Rose-Beetle—an insect which for nearly a century has ravaged the orchards and vineyards of the Eastern United States. From these experiments it seems that fruit and foliage may be protected from this pest simply by spraying with a dilute lime wash. Article III discusses various insects affecting currants and gooseberries, and the methods by which they may be destroyed, while Article IV treats of certain raspberry insects in the same way. Article V consists of a contribution to a knowl-

edge of the autumn life-history of two species of injurious plant-lice, whose winter histories have not before been recorded. The following article discusses various insects affecting garden crops, which have attracted especial attention during the season, and Article VII records some experiments with heat as a remedy for Pea and Bean Weevils—a new method of destroying these pests, which promises important results. Finally there will be found, as the three concluding subjects, a discussion of the Chinch Bug in Ohio—its life-history, contagious diseases, and experiments with methods of preventing its ravages; notes on two potato insects, and also on the injuries of the Spotted Grape-vine Beetle.

As an appendix to the report proper there appears a bibliographical list of the articles published by the entomologist during the year. This list includes upwards of fifty entries—seven of them being technical articles, while the remainder are economic or popular.

The results of the season's work, especially in the investigation of the life-histories of insects, are far from satisfactory to me, but as there was almost nothing in the way of equipment for the Division when the work was begun in April, and as the quarters occupied were temporary, being changed twice during the season, the opportunities for satisfactory work were small. The correspondence of the Division also required considerable time, especially during the spring and early summer. Insects were constantly being received, not only from Ohio, but also from at least a dozen other states, with queries as to their habits, life-histories, remedies, etc. Many of these came through the editors of various agricultural and horticultural journals, in which the answers were published; of such journals especial mention may be made of the *Ohio Farmer*, *Popular Gardening*, *Prairie Farmer*, *Garden and Forest*, *American Garden*, *Orange Judd Farmer*, *Indiana Farmer*, and *Farm and Home*.

Two bulletins have been issued by the Division; Bulletin No. 3, containing two articles, one discussing the spring and summer treatment of apple orchards to prevent insect injuries, and the other outlining some proposed experiments with remedies for the Plum Curculio; and Bulletin No. 4, also consisting of two articles, the first reporting some experiments in preventing Curculio injury to cherries, and the second discussing midsummer remedies for the chinch bug. Extracts from both these bulletins were published by a large number of agricultural papers all over the country.

During the year I have read papers at two meetings of the State Horticultural Society, and at the meetings of the Columbus Horticultural Society.

As to the future plans and needs of the Division, perhaps little need be said in this connection. I hope, however, in the near future to begin the distribution of small economic collections of insects to such granges and rural societies as will properly provide for them, believing that in this way a practical acquaintance with insect friends and foes will be made by those having access to the collections more rapidly than by any other method. I also hope that the time may soon come when there will be undertaken, through the co-operation of those connected with this Station and the State University, who are especially interested in the natural history sciences, a systematic biological survey of Ohio—aiming not merely at a descriptive list of the animals and plants of the State, but rather at a careful study of our flora and fauna as an *organic whole*, learning the relations of the various forms to each other and to their surroundings. Such a study could not fail to be productive of great practical good to all concerned, and to redound to the glory of the State, and the institutions at which it was conducted.

Finally, I have the pleasure of acknowledging my obligations for the cordial co-operation received from yourself and my colleagues in carrying on the season's work.

Respectfully submitted.

CLARENCE M. WEED, *Entomologist.*

CHAS. E. THORNE,
Director Ohio Agr. Exp. Station.

THE INSECT RECORD FOR 1888.

The most important entomological event of the year in Ohio was the appearance, in destructive numbers, and over a wide area, of that plague of the prairie states, the CHINCH BUG (*Blissus leucopterus*). Although this insect has been known to do some damage in this State, especially in the southern counties, in years past, I can find no record of so general and destructive an outbreak within the last decade. Fortunately, however, there has also appeared among the bugs a fungous disease, which has destroyed them by millions in other States, and which will probably, to a great extent at least, check their further increase with us.

During July I received from the northern counties of the State many accounts of injury to oats, due to the GRAIN PLANT-LOUSE (*Siphonophora avenae*). The outbreak covered a large area, and in many places was very severe, every oat-head being literally alive with the insects. Of course the effect of these millions of mouths sucking the sap from the plants just when it was needed to perfect the grain, was seen in the shrunken kernels harvested. Fortunately, a large number of plant-lice enemies also appeared, and destroyed many of the pests.

The HESSIAN FLY, at least so far as can be judged from the correspondence of this Division, is below the danger line in most parts of the State. Some specimens of the "flaxseeds" of this insect in volunteer wheat, received early in September, from Mr. John C. Collett, of Waynesville, are of special interest as establishing the fact that there occurs here what Professor S. A. Forbes has been at much pains to prove is the case in Illinois—a third brood developing during summer in volunteer wheat. This places before us a remedy, first suggested by Professor Forbes, which appears to be of easy application, consisting simply of destroying the crop of volunteer wheat with a rotary harrow, or some similar instrument, when the Hessian Fly larvæ are only partially grown, and unable to survive the destruction of their food supply.

Serious injury to grapes, peaches, and similar fruits, has been done during the summer, in some of the eastern counties, by the ROSE BEETLE (*Macrodactylus subspinosus*). Specimens of this insect were received for identification from Mr. A. E. Rusk, of Fairpoint, Belmont county, who wrote, under date of July 18, that they had been troublesome for the last five years. He says that the beetles make their appearance about June 1, attacking grapes, peaches, cherries and apples, and that he has seen twenty-five or thirty of them on a single peach. About the same time, Mr. E. A. Dunbar, of Ashtabula county, wrote for information concerning this insect, and was advised to spray his trees and vines with lime wash, which he did, finding that it drove the bugs away very satisfactorily. The details of his experiments will be found on another page.

From various letters received during the season, as well as from personal observation, I conclude that the PEA WEEVIL (*Bruchus pisi*), and the BEAN WEEVIL (*Bruchus obtectus*), are very generally distributed and inflict serious injury upon the agricultural public of Ohio. In order to get at a remedy of practical value, I instituted, during the summer, a series of experiments with heat to destroy the larvæ of the pea-weevil, the

results of which are reported in detail on a subsequent page. I may say here, however, that it was found that the larvæ may easily be destroyed by exposing the ripe peas, as soon as harvested, for one hour, to a temperature of 145° Fahr., and that this temperature will not injure the germinating powers of the peas.

That old-time enemy of the apple orchard, the CANKER-WORM, (*Anisophteryx vernata*), seems to be holding its own in most regions of the State where it has heretofore been present. Considerable injury was done by it in Franklin county, and an especially serious outbreak was reported by Mr. Isaac Radford, from Athens county. The experience of this season confirms that of previous years in proving that this insect can be effectually destroyed by thoroughly spraying with the arsenites, Paris green or London purple.

A bit of experience with the Athens county outbreak just mentioned, illustrates the importance of a knowledge of the life-history of any insect before taking radical measures for its destruction. Under date of May 14th, Mr. Radford wrote that he was unable to hold the canker-worms in check by the use of poisons (afterwards found to be due to the imperfect spraying apparatus he was using), and added:

"The neighbors fear that they will spread, and spread they will. What would you think of the propriety of asking the State to pay for the orchard, and cut it down? My neighbors are unanimously insisting on having it cut down, and the brush burned."

To this portion of the letter the following reply was sent under date of May 15th:

" * * * As to cutting down your orchard, I would say most emphatically, *don't*. You could get no indemnity from the State, and besides, could take no course at present that would more surely cause the worms to spread to your neighbors' orchards. If the trees were cut down now, the worms would largely migrate before they could be destroyed, and this would insure their introduction all over the neighborhood much more rapidly than would be possible any other way."

On account of the immense crop of apples this year, and the comparatively small crop of last year, the injuries of the CODLING MOTH, or APPLE WORM, (*Carpocapsa pomonella*) have been less marked than usual, especially in orchards in full bearing. In young orchards, however, where there was comparatively little fruit, the ravages of this insect were very noticeable, all the apples on many trees examined being wormy. The practice of spraying with poisons in the spring is gaining ground with our best horticulturists, and I hope will soon be the universal custom, especially among the commercial fruit growers.

Over a large section of the State the injuries of the PLUM CURCULIO (*Conotrachelus nenuphar*) have been much less than usual, apparently on account of the presence of the parasites which prey upon it. These parasites were frequently observed at work about the Curculio crescents on the plums in Franklin county. A good crop of plums was reported from many regions where heretofore the fruit has always been destroyed.

A series of elaborate experiments conducted by me during the past season, with London purple as a remedy for this insect, are reported in another place. So far as can be judged from a single season's work, the results indicate that a large proportion of the fruit liable to injury by the Curculio may be saved by spraying with London purple or Paris green. It has also been discovered that the preventive action of the poison is explained by the fact that the adult beetle feeds on the leaves and fruit of the plum, and is fully exposed to injury when these food-substances are coated with poison.



FIG. 1. The Clover Root-Borer.
[After Riley.]

One of the most notable entomological events of the season was the discovery that the CLOVER ROOT-BORER (*Hylastes trifolii*) has been present in injurious numbers in the northern and northeastern parts of the State for several years. This is one of the very worst enemies of the clover crop, and no satisfactory method of checking its ravages has as yet been suggested. My attention was first called to the outbreak last August in a letter from Mr. G. P. Lozer, of Stark county, in which an account was given of a serious injury to clover, of unknown origin, so fatal that two large fields were almost wholly destroyed. Subsequent investigations proved the author of the mischief to be this root-borer. I called attention through the *Ohio Farmer*, to the presence of the pest, and in consequence found that it was very generally distributed through some of the northern counties, where great damage has already been done by it.

That the farmers of the State may know more definitely what to expect in watching for the appearance of this insect on their respective farms, I have inserted the accompanying illustration (Fig. 1.), which shows at a the characteristic boring of the clover roots; at b, the grub, or larva; at c, the pupa, and at d, the adult beetle; the three latter being much magnified.

Of the effect of this insect upon the agricultural procedure of New York State, Professor I. P. Roberts writes:

"In Central New York, of late years, we mow the seeded land but once, and pasture in the fall the abundant second growth. Since 1878 the Clover Root-Borer has worked the clover to such an extent that it invariably fails the second year. This has caused us to change from a five to a four-year rotation, viz.: hay, corn, oats and wheat." (Beal's Grasses of North America, v. I, p. 378).

Probably the farmers of Ohio will be compelled to adopt a similar method wherever this pest obtains a firm foot-hold. But as some of the leading agriculturists of the State claim that the best results are obtained by cutting but one year's crop of clover and then turning under, the insect may possibly be a blessing in disguise.

Another enemy of the clover-crop which has been doing great damage in many regions of the State is the CLOVER SEED MIDGE (*Cecidomyia leguminicola*). This insect has apparently been present for a number of years, and has frequently diminished the crop of clover seed. With these two pests to contend against, the outlook for the continued production of this invaluable plant—so justly called the sheet-anchor of American agriculture—is certainly not encouraging.

As a preventive of the ravages of this midge it seems to be pretty well established that early cutting is followed by a good yield of seed. By this method the first crop of clover—that which is intended for hay—is cut as soon as the blossoms are fairly out, and before they have begun to turn brown. The philosophy of this is that the first brood of the midge larvæ are thus destroyed. A modification of this method, which seems to promise excellent results, has been reported to me by Mr. John Warren, of Lodi, Medina county, a very successful farmer of long experience, who is much interested in the production of clover seed. On the 17th of May, Mr. W. ran his mower over the field, and let the clover thus cut down lie on the ground as a mulch and fertilizer. There

then developed a vigorous crop of clover blossoms, which came between the regular crops, and also between the two broods of the midge, thus escaping attack. The field yielded at the rate of nearly seven bushels to the acre. When the clover was first cut the green heads were just forming. This remedy is well worthy of trial, and I hope it will be largely tested, especially in the northern part of the State, where clover seed forms so important a part of the farm produce.

From a statement made in a letter received from Mr. A. Whipple, of Madison, Lake county, it appears that this seed-midge is not, as has been generally supposed, an insect of recent introduction, but that it has, on the contrary, been at work in the State for many years. Mr. W. writes: "I think the midge no worse now than twenty-five years ago, for it was very common then. But as I was not raising seed at that time, I did not pay as much attention to it as now."

An outbreak of the CLOVER HAY-WORM (*Asopia costalis*) was reported, in March, from Flushing, Belmont county, by Mr. C. H. McCall, who sent a number of specimens, "discovered in a timothy hay rick in which there was a slight mixture of clover." Mr. M. states that "they seemed to be innumerable, being especially abundant among the clover, in which there was a fine web." This insect has long been known to have the habits thus described, and it is especially liable to do injury in old ricks which are not cleaned out every year. Hence this precaution should always be taken.

ARTICLE I. SOME EXPERIMENTS IN PREVENTING THE INJURIES OF THE PLUM CURCULIO.*

(*Conotrachelus nenuphar*. Herbst.)

Order, COLEOPTERA: Family, CURCULIONIDÆ.

There have, from time to time, appeared in various agricultural journals, statements to the effect that the injuries of the Plum Curculio (*Conotrachelus nenuphar*) can be prevented by the application of the arsenites (London purple or Paris green) soon after the fruit forms, according to the method commonly adopted to prevent the depredations of the Codling Moth upon apples; but these statements rest, so far as I know, upon no carefully conducted, definite experiments, and have been quite commonly discredited—some eminent entomologists even denying the possibility of destroying the Curculio in this way. In order to test the matter as thoroughly as possible, I undertook, the past season, a series of definite experiments, the results of which, as detailed in this article, seem to show that a large proportion of the loss usually suffered on account of

*That part of this experiment which relates to the cherry has already been published in Bulletin No. 4 of this Station.

the injuries inflicted by this insect may be prevented by the application of London purple to the trees, two or three times, soon after the blossoms fall.

EXPERIMENTS WITH CHERRIES.

For the of carrying on these experiments, a young orchard of Early Richmond cherry trees was kindly placed at my disposal by the Station Horticulturist, Mr. W. J. Green. This orchard contains about seventy-five trees, which have been in bearing several years, and is surrounded on every side by fruit trees of various kinds. The fruit borne by it has heretofore generally been seriously injured by curculios. As a convenient dividing line, a lane running north and south, about midway through the orchard, was taken, and the trees west of it were sprayed with London purple, while those on the east were not.

EXPERIMENTS WITH LONDON PURPLE.

The London purple used in these experiments was obtained in unbroken packages, and was manufactured by Hemingway's London Purple Company, of London, England. It was applied in the proportion of one-half pound to fifty gallons of water, by means of a Nixon barrel machine and Climax nozzle. The trees were thoroughly wet at each application, and no injury to the foliage was done, except in the case of two trees, on which the liquid was directly forced in a solid stream.

EXPERIMENT I.

In this experiment thirty-five trees were sprayed, only eight of which, however, were examined to determine the effect of the treatment. The first application was made May 15, just after the blossoms had fallen, and before the calyces on a large proportion of the fruit had been cast. Heavy rains fell May 18, and the application was repeated May 21. Rain again fell May 25, and the trees were sprayed for the last time the day following, although washing showers occurred the 27th and 28th of the month.

These trees received no other treatment during the season; and as the time of ripening approached, eight of the sprayed trees in various parts of the orchard were selected for examination, and seven suitable check trees were taken from the unsprayed portion (in one case the same check being used for two treated trees), and the two sets of trees paired off as carefully as possible, respect being had especially to their relative positions and fullness.

FALLEN FRUIT.

I at first intended to keep an account of the amount and percentage of injury of the fallen fruit, but I found the number of cherries that had fallen so small as compared with the whole number on the tree, that the idea was abandoned before the work was finished. The examinations that were made, however, showed a very decided difference in favor of the sprayed trees. For instance, under two unsprayed trees 97 and 100 cherries were collected, of which the first lot contained 51 wormy specimens, and the second 45; while from similar sprayed trees the number of fallen cherries was very much smaller, and the ratio of injury less. The results from five trees are as follows, the numbers on the left being the number picked up, while those to the right show the amount of injury:

Tree B, 51	5.	Tree E, 40	6.
Tree C, 90	10.	Tree F, 30	6.
Tree G, 70		15.	

PICKED FRUIT.

The examination of the picked fruit began June 11, when a large proportion of it was well colored, and continued until June 17, when the cherries were ripe. One thousand cherries were usually picked from each tree, care being taken to select limbs in all parts of it, and strip them thoroughly, so that a fair average might be obtained. The cherries thus obtained were carefully examined for curculio injuries, each cherry being cut open and closely scrutinized, and an accurate account of the number of injured ones kept. By far the greater part of this work was done by myself, although a portion was turned over to an assistant, under my direct supervision.

TREE A.—This tree was moderately full of fruit, and was examined June 11, when the cherries were well colored, but some days before they were ripe. The picked fruit examined gave the following results, the numbers to the right showing the amount of injury in each hundred examined:

1. 100.....	3	7. 100.....	4
2. 100.....	2	8. 100.....	2
3. 100.....	3	9. 100.....	3
4. 100.....	2	10. 100.....	4
5. 100.....	4		
6. 100.....	2	1,000	29

Percentage, 2.9.

The check on this tree was examined June 15, with the following results:

1. 100.....	4	7. 100.....	6
2. 100.....	7	8. 100.....	14
3. 100.....	6	9. 100.....	13
4. 100.....	7	10. 100.....	10
5. 100.....	8		
6. 100.....	12	1,000	87

Percentage, 8.7.

TREE B.—This tree was examined June 13, and was moderately full of fruit. The results are:

1. 100.....	3	7. 100.....	3
2. 100.....	3	8. 100.....	1
3. 100.....	5	9. 100.....	1
4. 100.....	1	10. 100.....	4
5. 100.....	3		
6. 100.....	0	1,000	24

Percentage, 2.4.

The check on this tree, examined the same day, gave the following results:

1. 100.....	22	7. 100.....	23
2. 100.....	26	8. 100.....	23
3. 100.....	26	9. 100.....	21
4. 100.....	18	10. 100.....	18
5. 100.....	23		
6. 100.....	15	1,000	215

Percentage, 21.5.

TREE C.—The fruit on this tree, which was moderately full, was examined June 13. The results are as follows:

1. 100.....	1	7. 100.....	0
2. 100.....	1	8. 100.....	0
3. 100.....	2	9. 100.....	1
4. 100.....	0	10. 100.....	0
5. 100.....	1		
6. 100.....	0		
		1,000	6

Percentage, 0.6.

The check on this tree was examined June 15, with these results:

1. 100.....	11	7. 100.....	15
2. 100.....	14	8. 100.....	17
3. 100.....	11	9. 100.....	15
4. 100.....	15	10. 100.....	15
5. 100.....	18		
6. 100.....	17		
		1,000	148

Percentage, 14.8.

TREE D.—This tree, which was examined June 13, was very full, and gave the following percentages:

1. 100.....	3	7. 100.....	3
2. 100.....	3	8. 100.....	0
3. 100.....	2	9. 100.....	6
4. 100.....	2	10. 100.....	1
5. 100.....	4		
6. 100.....	3		
		1,000	27

Percentage, 2.7.

The check was examined June 15, with the following results:

1. 100.....	5	7. 100.....	11
2. 100.....	10	8. 100.....	14
3. 100.....	7	9. 100.....	9
4. 100.....	13	10. 100.....	13
5. 100.....	7		
6. 100.....	12		
		1,000	101

Percentage, 10.1.

TREE E.—This tree was examined June 14, with these results:

1. 100.....	3	7. 100.....	3
2. 100.....	3	8. 100.....	2
3. 100.....	2	9. 100.....	6
4. 100.....	5	10. 100.....	8
5. 100.....	4		
6. 100.....	4		
		1,000	40

Percentage, 4.

The results from the check tree were as follows:

1. 100.....	19	7. 100.....	19
2. 100.....	24	8. 100.....	12
3. 100.....	21	9. 100.....	10
4. 100.....	18	10. 100.....	14
5. 100.....	28		
6. 100.....	23		
		1,000	188

Percentage, 18.8.

TREE F.—This tree had very few cherries on it, and was in such a position that it was somewhat difficult to reach in spraying, so that it may not have been as thoroughly treated as some others. It was examined June 14, with the following results:

1. 100.....	6	7. 100.....	2
2. 100.....	9	8. 100.....	6
3. 100.....	5	9. 100.....	10
4. 100.....	7	10. 100.....	6
5. 100.....	4		
6. 100.....	4	1,000	59

Percentage, 5.9.

The check for this tree was examined June 11, with the percentages given below as a result:

1. 100.....	10	10. 100.....	15
2. 100.....	11	11. 100.....	15
3. 100.....	15	12. 100.....	15
4. 100.....	19	13. 100.....	13
5. 100.....	19	14. 100.....	14
6. 100.....	22	15. 100.....	17
7. 100.....	19		
8. 100.....	17	1,500	232
9. 100.....	11		

Percentage, 15.4.

TREE G.—Examined June 14. The tree was quite full and gave the following results:

1. 100.....	2	7. 100.....	1
2. 100.....	3	8. 100.....	2
3. 100.....	1	9. 100.....	4
4. 100.....	2	10. 100.....	2
5. 100.....	2		
6. 100.....	0	1,000	19

Percentage, 1.9.

The check tree, which was examined June 12, was moderately full and gave the results which follow:

1. 100.....	8	7. 100.....	8
2. 100.....	18	8. 100.....	10
3. 100.....	17	9. 100.....	8
4. 100.....	9	10. 100.....	12
5. 100.....	10		
6. 100.....	15	1,000	115

Percentage, 11.5.

TREE H.—This tree was examined June 17. It was only moderately full, and was very exposed situation, where it was liable to invasion from the unsprayed trees. Its check was next to it. The percentages are as follows:

1. 100.....	7	7. 100.....	9
2. 100.....	9	8. 100.....	6
3. 100.....	10	9. 100.....	8
4. 100.....	8	10. 100.....	4
5. 100.....	8		
6. 100.....	7	1,000	76

Percentage, 7.6.

The check on this tree was the same as for Tree E. It was examined on the same day and gave a percentage of 18.8.

These results may be tabulated as a whole, as follows:

Sprayed with London purple.			Check.		
Tree A.	1,000	29	1,000	87	
" B.	1,000	24	1,000	215	
" C.	1,000	6	1,000	148	
" D.	1,000	27	1,000	101	
" E.	1,000	40	1,000	188	
" F.	1,000	59	1,500	232	
" G.	1,000	19	1,000	115	
" H.	1,000	76			
	<hr/> 8,000	<hr/> 280	<hr/> 7,500	<hr/> 1,086	
Percentage, 3.5.			Percentage, 14.5.		
Percentage of benefit, 75.8.					

That is to say, this table shows that 75.8 per cent. of fruit on the sprayed trees that was liable to injury by the plum curculio was saved by the treatment with London purple.

In order to bring these results more clearly before the reader's mind, I have reduced them to the diagram on page 140, which shows the relative injury to the fruit on the trees A to H, and their respective checks. The extremity of the black band represents the percentage of injury to the sprayed tree, and that of the open band the percentage of injury to its unsprayed companion. Of course the open band begins at the same point (o) as the closed one. The triangle opposite the word "total" shows the percentage of benefit resulting from the spraying.

As an additional check upon the correctness of the percentages of injury to the sprayed trees given above, I selected at random, at the time of picking, a half bushel of fruit from this part of the orchard and examined it for wormy cherries, the result being that only thirty-eight were found in the lot. As it takes about two hundred cherries to make a quart, this represents an injury of very little more than one per cent. to the fruit that was picked, although some of the worst injured cherries were probably discarded by the pickers. The foreman of the gardens, Mr. Holmes, informed me that he had never seen the fruit from these trees so free from injury.

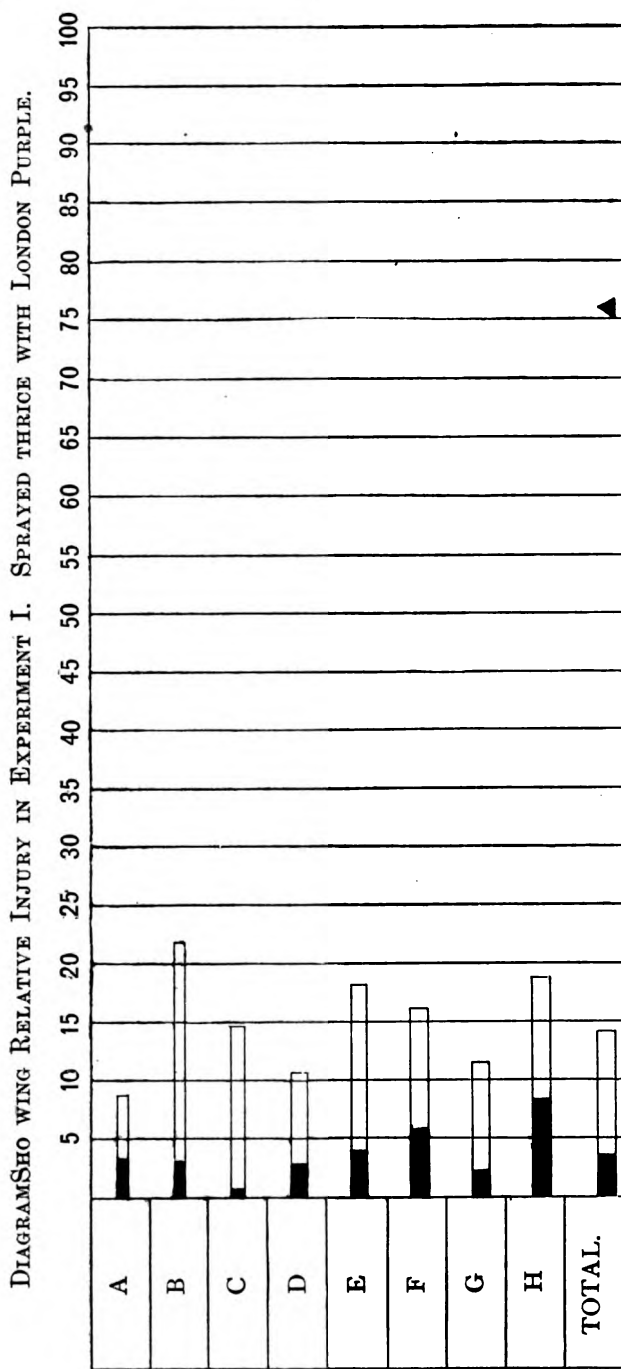
EXPERIMENT II.

This experiment was undertaken to learn what effect, if any, one more spraying than was given in Experiment I would have, but as only two trees were included the results were not sufficient to shed any light upon the subject. These trees were treated exactly as those above mentioned, except that they were given an additional spraying June 2.

TREE A.—This tree was situated on the corner of the orchard, in an exposed position. There was practically no fallen fruit. One thousand cherries on the trees, examined June 14, gave a percentage of 4.2.

TREE B.—Moderately full. Situated at end of row in an exposed situation. Not enough fallen fruit to signify. One thousand cherries examined June 14, gave a percentage of 2.7.

These results simply confirm the results of Experiment I, but are not sufficiently marked to show any especial benefit from additional spraying.



EXPERIMENTS WITH LIME.

Desiring to test also the efficiency of lime as a preventive of curculio injury to cherries, I selected for the experiment the north row of the untreated half of the orchard above mentioned, and two trees some distance away at the south end of the pear orchard. Lime water, made by adding about a half-peck of fresh air-slaked lime to a barrel of water, was applied to these until the foliage was well whitened. The first application was made May 17, when the blossoms had recently fallen. The day following heavy rains washed most of the lime off, and the application was repeated May 21. Rain again fell May 25, and the lime was applied the day following, only to be largely washed off by heavy showers May 27 and 28. A final application was made June 2, which was not washed off until the fruit was nearly ready to pick.

Only three of the ten trees in the row were examined, which, with the two south of the pear orchard, make five in all.

TREE A.—This tree was examined June 15. It was in the corner of the orchard in an exposed situation, and was very full of fruit.

1. 100	15	7. 100	4
2. 100	3	8. 100	9
3. 100	4	9. 100	4
4. 100	11	10. 100	2
5. 100	5		
6. 100	6	1,000	73

Percentage, 7.3.

The check on this tree was examined June 12. Results :

1. 100	8	7. 100	8
2. 100	18	8. 100	10
3. 100	17	9. 100	8
4. 100	9	10. 100	12
5. 100	10		
6. 100	15	1,000	115

Percentage, 11.5.

TREE B.—This tree, which was quite full, and situated in the middle of the row, was examined June 16, with the following results :

1. 100	5	7. 100	5
2. 100	6	8. 100	9
3. 100	6	9. 100	6
4. 100	5	10. 100	8
5. 100	8		
6. 100	12	1,000	70

Percentage, 7.

The check tree was examined June 13, with the results which follow :

1. 100	22	7. 100	23
2. 100	26	8. 100	23
3. 100	26	9. 100	21
4. 100	18	10. 100	18
5. 100	23		
6. 100	15	1,000	215

Percentage, 21.5.

TREE C.—This tree was full, and was examined June 17. The results were:

1. 100	12	7. 100	13
2. 100	14	8. 100	15
3. 100	8	9. 100	9
4. 100	10	10. 100	12
5. 100	6		
6. 100	14	1,000	127

Percentage, 12.7.

The check on this tree was examined June 11, with these results:

1. 100	10	7. 100	19
2. 100	11	8. 100	17
3. 100	15	9. 100	11
4. 100	19	10. 100	15
5. 100	19		
6. 100	22	1,000	158

Percentage, 15.8.

TREE D.—This tree and the following one were isolated from the other cherry trees, being at the south end of the pear orchard, but they were surrounded by fruit of various kinds, and although there were no check trees in their immediate vicinity we may fairly take the percentage of injury of the total of the check trees in Experiment I as a basis of comparison.

This tree was examined June 17, with the following results:

1. 100	17	7. 100	8
2. 100	10	8. 100	5
3. 100	8	9. 100	12
4. 100	6	10. 100	9
5. 100	9		
6. 100	6	1,000	90

Percentage, 9.

TREE E.—This tree was very full and was examined at the same time as the last, with the following results:

1. 100	18	7. 100	8
2. 100	12	8. 100	10
3. 100	11	9. 100	6
4. 100	9	10. 100	12
5. 100	9		
6. 100	10	1,000	105

Percentage, 10.5.

Tabulating these results we get:

Sprayed with lime.		Check.	
A. 1,000	73	1,000	115
B. 1,000	70	1,000	215
C. 1,000	127	1,000	158
D. 1,000	90	1,000	145
E. 1,000	105	1,000	145
5,000	465	5,000	778

Percentage, 9.3.

Percentage, 15.6.

Percentage of benefit, 40.3.

This shows that lime was much less efficient than London purple, the percentage of saving being only about half as great.

METEOROLOGICAL CONDITIONS.

It will have been noticed that about the time of spraying there were frequent and heavy showers, and as a result I was unable to carry out my original plan of testing the comparative effects of one, two and three sprayings. In an ordinary season, however, I am sure that two applications would have been as effective as the three that were given in Experiment I, and three as effective as the four in Experiments II and III.

The rainfall during the time covered by these experiments is indicated in the following table, kindly prepared, at my request, by Mr. Moses Craig, Meteorologist to the Station :

	Inches.		Inches.
May 16.....	.06	May 28.....	.45
" 17.....	.01	" 29.....	.04
" 18.....	.79	" 31.....	trace
" 22.....	trace	June 10.....	.01
" 23.....	"	" 21.....	trace
" 25.....	.33	" 22.....	.02
" 27.....	.56		

DANGER TO HEALTH.

Of course the first question that arises after proving that sound cherries may be raised by spraying with London purple is whether there is any danger to health in using such fruit. In order to test this I carefully picked two quarts of cherries from each of the London purple lots, taking care not to touch the cherries, but snipping the stems off with a pair of shears, and submitted them to Professor Henry A. Weber, of the chair of agricultural chemistry of the Ohio State University, for analysis. It will be remembered that the fruit in Experiment I was washed by heavy rains after the last spraying, but that in Experiment II it had received only .03 of an inch during the interval between last spraying and the picking of the fruit (June 2 to June 23). Both lots were carefully washed and the substances thus obtained tested for arsenic, but no trace of it could be found. Hence it seems probable, as has been suggested by Professor Weber, that the arsenic may have volatilized in Experiment II on account of the prolonged exposure to the sun and air.

These results seem to me to justify the conclusion that this remedy is a safe one if the trees are not sprayed later than three or four weeks before the time of ripening.

SUMMARY OF CHERRY EXPERIMENTS.

(1.) These experiments were undertaken to learn what effect the application of London purple and lime to cherries soon after the fruit forms would have in preventing the injuries of the plum curculio, or in other words in lessening the number of wormy cherries.

(2.) For the carrying on of the experiment a half-acre orchard of bearing trees was set aside, and a part of it treated while the rest was left as check.

(3.) London purple was applied in a water spray, mixed in the proportion of one-half pound to 50 gallons water.

(4.) Lime was applied in a water spray, mixed in the proportion of four quarts to 50 gallons, until the leaves were whitened.

(5.) The cherries were critically examined when nearly ripe, and the exact number of specimens injured by the curculio recorded. In this way 22,500 cherries were individually cut open and recorded.

(6.) From eight trees sprayed thrice with London purple, 8,000 cherries were examined, of which 280, or 3.5 per cent., were wormy, while from seven companion trees not treated, 7,500 were examined, of which 1,086, or 14.5 per cent., were wormy. This represents a saving of $\frac{1}{4}$, or 75.8 per cent., of the fruit liable to injury.

(7.) From two trees sprayed four times with London purple, 2,000 cherries were examined, of which 69, or 3.45 per cent., were wormy.

(8.) Two quarts of cherries from each of these lots were chemically examined at the time of ripening, by Professor H. A. Weber, and showed no trace of arsenic in any form.

(9.) Five trees sprayed four times with lime, yielded 465 wormy cherries out of 5,000 examined, while five check trees yielded 778 wormy cherries from 5,000 examined. The percentage of the former was 9.3 while that of the latter was 15.6, which gives a percentage of benefit from the treatment of 40.3.

CONCLUSIONS OF CHERRY EXPERIMENT.

These experiments seem to me to show so far the results of a single season's work with a single variety of cherry can be relied upon :

(1.) That three-fourths of the cherries liable to injury by the Plum Curculio can be saved by two or three applications of London purple in a water spray made soon after the blossoms fall.

(2.) That if an interval of a month occurs between the last application and the ripening of the fruit, no danger to health need be apprehended from its use.

(3.) That lime is not so certain in its preventive effect as London purple, saving in these experiments only forty per cent. of the fruit liable to injury.

EXPERIMENTS WITH PLUMS.

The opportunity for carrying on the plum experiment was less satisfactory than in the case of the cherry; and it was impracticable to get at definite percentages of injury. Five trees were sprayed four times with London purple, mixed in the proportions of one-half pound to fifty gallons water.* The first application was made May 15, just after the blossoms had fallen. Heavy rains fell May 18, and the application was repeated May 21. Rain again fell May 25, and the trees were sprayed the day following, just in time to receive the heavy showers of the 27th and 28th, so that it was thought advisable to make a final application June 2.

The fruit on all these trees was almost free from Curculio injury, the limbs hanging so full that it was necessary to artificially thin the fruit to prevent their breaking. The check trees, unfortunately, did not set a large crop, but a large proportion of what did set was injured by Curculios, although the injury was much less than usual on account of the presence of Curculio parasites.

EXPERIMENTS WITH LIME.

Three plum trees, sprayed heavily with lime, four times, matured an immense crop of fruit. The plums were well coated with lime during their season of growth; and it would have been difficult for the Curculios to work upon them.

EXPERIMENTS WITH PEARS.

A number of bearing pear trees were sprayed with London purple at the same time and in the same manner as described for the plum. The fruit was very perfect and largely free from injury either by the curculio or codling moth—much more so than unsprayed companion trees.

Equally good, if not better, results were obtained from a large number of pear trees sprayed with the usual London purple mixture, to which fresh air-slaked lime had been added in the proportion of a half-peck to a barrel of the solution. This combination seemed also to have the decided advantage of being much less liable to injure the foliage than the London purple alone.

* This strength of solution injured the foliage of some trees, and hereafter the proportion of one ounce London purple to ten gallons water will be used.

LIFE-HISTORY OF THE PLUM CURCULIO.

Perhaps no better concise account of the life-history of this insect has appeared in this country than that given by Professor Wm. Saunders in his treatise on Insect Injurious to Fruits, from which the following summary is taken :

The perfect insect is a small, rough, grayish or blackish beetle, about one-fifth of an inch long (shown magnified at *c* in Fig. 2), with a black, shining hump on the middle of each wing-case, and behind this a more or less distinct band, of a dull ochre-yellow color, with some whitish marks about the middle; the snout is rather short. The female lays her eggs in the young green fruit shortly after it is formed, proceeding in the following manner: Alighting on a plum, she makes with her jaws, which are at the end of her snout, a small cut through the skin of the fruit, then runs the snout obliquely under the skin to the depth of about one-sixteenth of an inch, and moves it backward and forwards until the cavity is smooth and large enough to receive the egg to be placed in it. She then turns around, and dropping an egg into it, again turns and pushes it with her snout to the end of the passage. Subsequently she cuts a crescent-shaped slit in front of the hole, as shown at *d*, so as to undermine the egg and leave it in a sort of flap her object, apparently, being to wilt the piece around the egg and thus prevent the growing fruit from crushing it. The whole operation occupies about five minutes. The stock of eggs at the disposal of a single female has been variously estimated at from fifty to one hundred, of which she deposits from five to ten a day, her activity varying with the temperature.

The egg is of an oblong-oval form, of a pearly white color, and large enough to be distinctly seen with the naked eye. By lifting the flap with the finger-nail, or with the point of a knife, it can be readily found. In warm weather it will hatch in three or four days, but in cold and chilly weather it will remain a week, or even longer, before hatching.

The young larva is a tiny, soft, footless grub, with a horny head. It immediately begins to feed on the green flesh of the fruit, boring a tortuous channel as it proceeds, until it reaches the center, where it feeds around the stone. It attains its full growth in from three to five weeks, when it is about two-fifths of an inch long, of a glassy yellowish white color, with a light brown head, a pale line along each side of the body, a row of minute black bristles below the lines, a second row, less distinct, above and a few pale hairs towards the hinder extremity. At *a*, Fig. 2, it is shown magnified. The skin

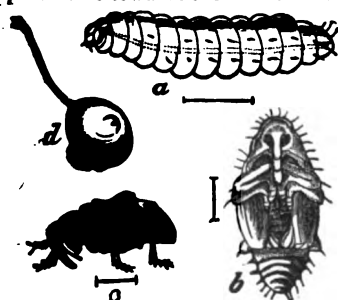


FIG. 2.—The Plum Curculio. [After Riley.]

of the larva being semi-transparent, the color of the internal organs shows through, imparting to the central portions of the body a reddish hue. The irritation arising from the wound, and the gnawing of the grub, causes the fruit to become diseased and gummy, and it falls prematurely to the ground, generally before the larva is quite full-grown. Within the fallen plum the growth of the larva is completed, when, forsaking the fruit it has destroyed, it enters the ground, burying itself from four to six inches deep, where, turning round and round, it compresses the earth on all sides, until a smooth oval cavity is formed, within which, in a few days, the larva

changes to a chrysalis, shown enlarged at *b*, and in from three to six weeks is transformed to a beetle, which is, at first, soft and of a reddish color, but soon hardens, and, assuming its natural hue, makes its way through the soil to the surface and escapes.

FOOD HABITS OF THE BEETLE.

That the adult curculio feeds upon the fruit, and foliage of the fruit infested by it, has been known for many years, but only recently has the economic importance of this fact been fully realized. Nearly twenty years ago Dr. Riley made the following statement:

During their beetle life these insects feed continually, just as long as the weather is mild enough to make them active. While fruit lasts they gouge holes in it, and after peaches are gone apples are badly attacked. They also gnaw large holes in the leaves, and when nothing else presents, will feed on the bark of the tender twigs.*

Before I had noticed the above statement concerning the food-habits of the adult curculio, in order to learn the extent to which it is exposed to injury when the fruit is coated with poison, I confined one in a jar, together with a large green plum, and was surprised at the avidity with which the fruit was eaten. A large portion of the surface was gnawed out for food, and not for purposes of oviposition, and thus the feasibility of poisoning the beetles is clearly shown.

Professor S. A. Forbes also informs me that he has found that besides gnawing out the fruit, the adult curculio eats freely of the substances of the leaves. He adds that the curculios "are certainly very freely exposed to destruction by poison, without reference to the habits of oviposition or the first food of the larvæ;" and that he has "also learned, experimentally, that spraying the leaves with Paris green would poison the beetles completely." Professor Forbes discussed at some length the details of his experiments, which point to the same conclusions as those here recorded, in an address delivered at a meeting of the Central Illinois Horticultural Society, held at Champaign during August, 1888.†

Additional evidence on the same subject has been reported by Professor J. H. Comstock, of the Cornell University Experiment Station, who publishes the following account of his observations in Bulletin No. III of that Station:

During the latter part of the past summer my attention was attracted to a serious injury to the fruit in an apple orchard through which I passed daily. A large proportion of the apples in one corner of the orchard had been eaten into by something which made small pits, from one-eighth to one-fourth of an inch in diameter, and of about the same depth. On one tree nearly every apple had been attacked, and in many cases there were ten to twelve holes in a single apple. The injury was so serious as to render the fruit on this part of the orchard unmarketable.

The holes in the apples were first observed during the latter part of August. At that time many of them were partially grown over, while others were fresh, indicating that the pest had been at work for a considerable time and was still active. As the injury to the apples resembles somewhat that caused by *Lithophane antennata*, a climbing cut-worm, that sometimes infests apples in Western New York, I at first searched for caterpillars and gave little thought to the Plum Curculios that I frequently found hiding

*3d Rept. St. Ent. Mo., 1871, pp. 13-14.

† *Prairie Farmer*, August 11, 1888.

in the holes in the apples. But after finding a considerable number of these insects in the pits, it occurred to me that they might be the cause of the mischief. Several perfect apples were then selected and placed in breeding-cages, in each of which were confined several curculios. The question was soon settled; within twenty-four hours the beetles had begun to eat into the apples. They made small holes at first, but these were soon enlarged so as to form pits of the size indicated above. We thus see that the Plum Curculio is a voracious feeder, and concluded that the spraying of the plum trees early in the season with Paris green water protects the fruit by the destruction of the adult curculios before they have laid their eggs.

EVIDENCE FROM OTHER LOCALITIES.

In Bulletin No. 89 of the Michigan Experiment Station, Professor A. J. Cook gives the following account of experiments made by him this season:

It will be remembered that I have used the London purple several years with quite indifferent success, to keep at bay the curculio. The fact that some fruit-growers reported excellent success with this remedy led me to conclude that possibly I had not been persistent enough in this warfare. The curculio commences to work anywhere on the plum, which has a smooth surface everywhere, while the codling moth lays its egg right in the cup or funnel-like calyx end of the apple. Thus the wind and rain would free the plum or cherry or general surface of the apple of the poison, much more readily and quickly than they would the rough cavity of the calyx end of the apple. Thus we can understand, how, granting that the arsenites are alike effective against codling moth and curculio, that more care would be required in resisting the attack of the latter. This season we arranged our experiments with this point directly in view.

June 4th, the trees, both plum and cherry, were jarred and curculios were caught. The mark of the curculio was also found on both cherries and plums.

The trees were sprayed June 6th, June 12th, and June 20th. The material was the same as that used in spraying the apples, viz.: one pound London purple to one hundred gallons of water.

Careful examination June 12th, found no stung cherries and very few plums. June 26th, 250 cherries were picked from the sprayed trees, and not one was injured. The crop of cherries was large, and no cherries from the sprayed trees were wormy. July 16th and 18th, the following plums were all gathered under the trees and cut open:

Tree 1 there were 16 plums, 10 wormy.

Tree 2 (Wild Goose), 117 plums, 23 wormy.

Tree 3 (Washington), 33 plums, 3 wormy.

Close examination found no stung plums on the trees, and the crop upon picking was very free from injury.

Cherry and apple trees near by not sprayed, suffered seriously.

From these experiments, and those of former years, I conclude that while one application will not save our plums and cherries, and prevent apples from being stung, two or three applications may be of signal advantage.

Secretary A. C. Hammond, of Warsaw, Illinois, a fruit-grower of long experience, after several seasons' experimenting with poison for the Plum Curculio, writes:

This year's experiments confirm me in the opinion that the curculio can be in a great measure controlled.

The correctness of the following statement, taken from a circular of the Field Force Pump Co., of Lockport, N. Y., has been vouched for by the firm referred to in a personal letter received from them :

After several years' experience, the Messrs. Moody & Sons, of this city, have found it quite impracticable to dispense with spraying under any circumstances, while as a result they have found it necessary to pick off from one-third to one-half of their plums in order to prevent the trees overbearing, and have marketed large crops of plums at remunerative prices each year, having about fifteen thousand plum trees in bearing.

Mr. Jabez Webster, a practical and intelligent fruit-grower of Marion county, Illinois, gives his experience as follows :

We accidentally stumbled over the fact that sixty to seventy gallons of water to a half-pound of the poison, in solution, was fully strong enough to check the curculio, and all or more than the peach tree would stand. We destroyed a plum tree and several peach trees with our experiments, and know that 100 gallons of water to one pound of poison in solution is too strong for the foliage of some varieties of apples, and that it will kill a peach or plum tree. My own opinion is that one-half pound of the poison to sixty gallons is safe, and if applied at the time of shedding the bloom on apple, and the second time ten days later, will destroy the leaf-eating insects and codling moths. But for plum and peach trees one-fourth of a pound to forty gallons of water is strong enough, and will, if applied twice, effectually check the ravages of the curculio without destroying the foliage.

CONCLUSIONS.

From the facts and experiments above recorded it seems that so far as the results of one season's tests can be relied upon, the evidence points strongly to the conclusion that this arch-enemy of the fruit-grower can be subdued by the application of the arsenites to the foliage and fruit, two or three times, soon after the blossom petals fall. But such questions cannot always be settled conclusively in a single season, and additional experimentation is needed, not only to confirm the results already obtained, but also to learn the safest and most effective proportions in which the poisons may be applied, the number of applications necessary, and the most profitable time for spraying the trees. So far as opportunity offers investigations along these lines will be considered in the future by the Station, upon its own grounds, and also in other parts of the State.

The conclusions to which these experiments point may be formulated as follows, premising always that as they are the result of but one season's work, the opportunities for doing which were not entirely satisfactory—both on account of the limited number of plum trees available and the presence of curculio parasites—they are not to be considered as final.

(1.) That a large proportion of the fruit liable to injury by the Plum Curculio may be saved by spraying with London purple or Paris green.

(2.) That the preventive effect of these poisons is probably due to their action upon the adult insect, being taken into the system with the fruit and foliage consumed for food.

(3.) That if an interval of a month or more occurs between the last application and the ripening of the fruit, no danger to health need be apprehended from its use.

(4.) That lime is less effective than London purple, and that good results are more likely to be obtained from its application to plums than cherries, its preventive effect depending almost wholly upon the extent to which each fruit is coated. It is also to be remembered that while London purple kills the insect, lime simply drives it away.

IMPORTANT CAUTION.

The experience of recent years has shown that London purple and Paris green are more likely to "scorch" some fruits than others, and that there is often a great difference in this respect even among varieties of the same fruit. It has also been learned that these poisons are effective when applied in much weaker proportions than was formerly thought necessary. What appears to be a perfectly safe, and at the same time effective proportion, for spraying various fruit trees with mixtures of the arsenites consists of *one ounce* of Paris green or London purple to *ten gallons* of water.

ARTICLE II. A PRACTICAL PREVENTIVE OF ROSE-BUG INJURIES TO GRAPES AND PEACHES.

Macrodactylus subspinosus Fabr.

Order COLEOPTERA: Family SCARABEIDÆ.

For more than half a century the Rose-beetle has been a scourge to the horticulturists of the Eastern and Middle States, destroying annually thousands of dollars worth of grapes, peaches and other fruits, and defying all remedies, except the tedious, and often impracticable one, of hand-picking.

Early last June I received from Mr. E. A. Dunbar, of Ashtabula, Ohio, a letter concerning rose-bug remedies, in which he said:

"Last year I sprayed my peach orchard when peaches were half-grown, to stop ravages of rose-bugs, which appeared to be taking all the fruit. I repeated the applications and strengthened the solution of Paris green until the foliage was half-killed and dropped off, but the bugs seemed to thrive on it, and when put into the solution were not affected. Hand-picking of rose-bugs was our last resort on both peach trees and grapes, which latter were badly hurt in spite of all we could do. How would a weak solution of kerosene work, sprayed on peach trees do? What is Bubach, and how applied? What is your best remedy for rose-bugs? They have taken tons of grapes for me for three years. Bagging is too expensive."

In response to this the following letter was sent :

"I regret that I have never had any personal experience with Rose-bugs, but I am inclined to think, from my experience with curculios this year, that they may be kept off by a liberal spraying of lime water—a regular whitewashing, in fact. I have sprayed our plum trees, in part, with a mixture of a half-peck of freshly-slaked lime to a barrel of water, and when the water evaporates the fruit and foliage is well-coated with the lime. I should certainly think that the Rose-bugs would not attack peach trees so coated, and have been anxious for some time to have this remedy tried against them. * * * * . Do not use less than half a peck of lime to a barrel of water, and, perhaps, a peck would be better. It must be strained as it enters the barrel, to prevent clogging the pump.

* * * * *

"I doubt whether the kerosene emulsion would do very much good, but it is worth trying. I suppose the trouble with these applications which kill by contact, is that there are so many bugs coming all the while that it is next to impossible to reach more than a small per cent. of them. As I have seen it put by an eastern grower, 'Where one is killed, a dozen come to the funeral.'"

In reply to this I received a letter, written under date of July 23d, in which Mr. Dunbar said :

"A thorough application of remedy advised by you was undoubtedly the means of saving me many dollars worth of fruit, for which result I feel profoundly grateful. *

* * Bugs appeared this year about June 12. One application of a coal oil emulsion to a few grapevines and rose bushes killed most of the bugs which were there, but others soon came—remedy of no use. I then mounted my field force-pump on a 40-gallon cask set on stone boat. I slaked about a peck of lime for each barrel, or 140 gallons of water, and the motion of the stone boat kept the lime in suspension. One man to hold the pump, and another to direct the spray on one side of one row at a time, as fast as the horse walked down the row, and we soon had the vineyard thoroughly whitewashed, and well onto the fruit, and under the leaves. I was disappointed at first in apparent results, as the bugs continued to be quite numerous, but after a few days they *cleared out*, having hurt the grapes very little, and I have a heavier crop than for several years past.

The west side of the peach orchard being nearest the house, and showing very few bugs, I did not visit the east side for several days, and when I did the bugs had got a good many peaches. I at once *whitewashed* the peach orchard in the same manner as the vineyard, with exception of west row, and the bugs all emigrated to that row in course of a day or two.

In the light of this experience it seems that the progressive fruit-grower can at least save a large part of his crop when the rose-bug swarms appear by so simple, safe and cheap a method that there will be little excuse if it is not practiced.

ARTICLE III. ON SOME INSECTS AFFECTING CURRANTS AND GOOSEBERRIES.

1. THE GREEN APPLE LEAF-HOPPER.

Empoa albopicta Forbes.

Order HEMIPTERA : family TETTIGONIDÆ.

These little insects appeared early in summer in great abundance on the currant and gooseberry bushes on the Station grounds, and did a noticeable injury to much of the foliage. They work upon the lower surface of the leaf, sucking out the sap much after the manner of plant-lice, but do not cause the leaves to curl up as the lice do. After they have been at work awhile the effect of their injuries may be seen in the whitish spots that appear on the upper leaf-surface.

I tried a number of experiments with pyrethrum to destroy these pests, and found that it killed them almost immediately. Hence this substance can doubtless be relied upon to clear a plantation should it become badly infested by them.

2. THE FOUR-STRIPED PLANT-BUG.

Pezilocapsus lineatus Fabr.

Order HEMIPTERA : family PHYTOCORIDÆ.

This insect was very abundant on the Station grounds during May and June, and affected a considerable percentage of the terminal shoots of the currant and gooseberry bushes. It proved very difficult to destroy. Apparently the only successful method of checking its ravages is that of shaking the bugs, early in the morning when they are torpid, into a pail or pan containing a film of kerosene.

The first full-grown bug seen during the season was captured June 2.

3. THE IMPORTED CURRANT WORM.

Nematus ventricosus Klug.

Order HYMENOPTERA : family TENTHREDINIDÆ.

It has long been known that this insect may be destroyed by powdered white hellebore; but a large proportion of those most interested either do not know it, or knowing it, do not put their knowledge into practice. As a matter of fact it is as easy and practicable to prevent the injuries of this insect, as it is to prevent the ravages of the Colorado potato beetle; and so long as hellebore is an effective and comparatively safe remedy, there is

no excuse for the somewhat common practice of using Paris green or London purple in its stead.

There is, on the Station farm, a half-acre patch of currant and gooseberry bushes, which have been attacked for years by the currant worm. This season the insect has been kept under control very effectively, the bushes remaining in good foliage, although early in spring, before the first treatment, the worms were so thick as to threaten complete defoliation.

The 5th of May the worms had begun work in numbers, and the bushes were thoroughly sprayed with a solution of one pound hellebore to 50 gallons water. For this purpose a Nixon barrel machine on runners was used, it being drawn by a horse between the rows. One person to work the pump and drive, while another directed the spray well onto the leaves, both above and below, was all that was needed. Two barrels (or 100 gallons) of the liquid went well over the patch, and three hour's work sufficed to finish the task.

Two days later (May 7,) most of the worms were on the ground beneath the bushes, in a dead or dying condition, although a few live ones still remained on the leaves.

The period of egg-deposition was not ended at the time of the first application, and the worms continued hatching for a week or more later, so it was necessary to spray the patch again May 16. The day following the worms were lying beneath the bushes by the hundreds, dead and dying. Eight of them were picked up from one square inch of soil surface. This application proved sufficient, it being unnecessary to treat the patch again during the season.

One bush, left as a check upon the experiment, was completely defoliated.

So much for the results; what was the cost? Work of man, boy and horse may fairly be estimated at 30 cents per hour. So the six hours' work amounted to \$1.80. Hellebore retails at 20 cents a pound: the four pounds used cost 80 cents. Total expense (excluding interest on machine, which is insignificant) of protecting one-half acre of currants and gooseberries, \$2.60, or say in round numbers, five dollars an acre. Currants sell readily in the Columbus market at a shilling a quart, so that 40 quarts would pay for fighting the worms on an acre of bushes, even where the labor is hired. But on most fruit farms this labor would cost practically very little, so that the only outlay would be for hellebore, which would amount to less than two dollars per acre.

ARTICLE IV. NOTES ON SOME RASPBERRY INSECTS.

I. THE RASPBERRY CANE BORER.

Oberea bimaculata Oliv.

Order COLEOPTERA: family CERAMBYCIDÆ.

The peculiar eggs of this insect were received during June, from Mrs. E. Spencer, of Chardon, Geauga county, O., who, in the accompanying letter, dated June 15, 1888, said:

"There is an insect which is doing some damage to raspberry bushes, particularly red varieties. It cuts through the green, or outer bark. It cuts two rings about three-fourths of an inch apart, a few inches from the tip of the shoot. The shoot soon wilts and in a few days falls over, parting at the lowest incision as smoothly as if cut with a knife."

This insect has been frequently discussed in our entomological literature, and rarely does serious injury. The only remedy as yet suggested is that of cutting and burning the twigs containing the eggs.

THE TREE CRICKET.

Oecanthus niveus Serv.

Order ORTHOPTERA: family GRYLLIDÆ.

Perhaps no other insect has so often been sent to the Station for identification as this. Through the spring and autumn months canes and twigs containing the peculiar eggs of the insect were received very frequently, and in many cases serious injury was reported.

The tree cricket has been so often discussed in our entomological reports and agricultural journals that the briefest recapitulation of its life-history will suffice in this connection. The eggs are laid by the adult cricket (illustrated at Fig. 3) during the autumn months, in the green canes of raspberries, blackberries, and grape-vines, and the young twigs of peach, maple, willow and various other fruit and shade trees. A section of the cane, after the eggs have been deposited, is shown at *a*, Fig. 4, and the same split open to show the eggs inside may be seen at *b*, while *c* represents a magnified egg.

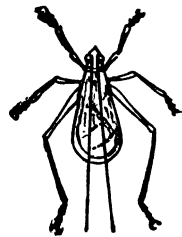


Fig. 3. Tree Cricket.

The eggs hatch usually during May, and the young crickets are said to live for a few weeks largely upon plant-lice, or even to devour the weaker individuals of their own species. When full-grown, however, the insect becomes a vegetarian, and sometimes does great damage by nipping off the stems of grape bunches, causing the fruit to fall to the ground and rot.



Fig. 4. Eggs of Tree Cricket.

A Franklin county horticulturist, who had two patches of raspberries, one old and the other young, in which these crickets were very numerous, raised the question, early in the fall, whether to cut down the old patch then or in the winter. I advised him by all means to wait, so as to get as many of the eggs deposited in the old canes as possible, and then cut and burn the plants. Inasmuch as cutting and burning infested canes is about the only remedy known for these pests, if they can be destroyed by the wholesale so much the better.

3. THE RASPBERRY SLUG.

Selandria rubi Harr.

Order HYMENOPTERA: family TENTHREDINIDÆ.

Mr. James Mitchell, of Grove City, Franklin county, brought to the Station, May 28, several canes of red raspberries which had been completely defoliated by the raspberry slug, an insect closely related to the imported currant worm. He reported a large patch badly infested, and desired information as to remedies. The next day I visited Mr. Mitchell's place, taking with me our Nixon barrel machine, and left it, with instructions to thoroughly spray the patch with a solution of one pound powdered hellebore to fifty gallons water. The infested patch consisted of three acres of red raspberries which had been planted seven or eight years. Young patches of red and blackcap varieties, near by, were not so badly infested, but there were a great many larvæ at work on them. The machine was returned June 1, with the report that three and one-half acres were gone over in a day, and the slugs mostly destroyed.

On the Station grounds the slugs were first noticed at work about May 12, when they were attacking the unfolding leaves.

LIFE-HISTORY OF THE INSECT.

The parent of the Raspberry Slug is one of the Sawflies, called by Harris, many years ago, *Selandria rubi*—the Raspberry Sawfly. The wings expand about half an inch. The front part of the body is black and the abdomen dark-red. As the life-history of the insect seems to be unknown to many of the horticulturists of the State, I extract the following account of it from Mr. Saunders' excellent treatise on Insects Injurious to Fruits:

The eggs are buried beneath the skin of the raspberry leaf, near the ribs and veins, and are placed there by means of the saw-like apparatus with which the female is provided. The egg is white and semi-transparent, with a faint yellow tinge and a smooth, glossy surface, oval in form, and about one-thirteenth of an inch long. The skin covering it is so thin and transparent that the movement of the inclosed larva may be observed a day or two before it is hatched, and the black spots on the side of the head are visible; it escapes through an irregular hole made on one side of the egg.

The newly hatched larva is about one-twelfth of an inch long, with a large, greenish head, having a black, eye-like spot on each side; the body nearly white, semi-transparent and thickly covered with transverse rows of whitespines. As it grows older it becomes green, very much the color of the leaf on which it is feeding, and on this account it would be difficult to discover were it not that it riddles the leaves by eating out all the soft tissues between the coarser veins. When full-grown it measures about three-quarters of an inch in length, is of a dark-green color, its body thickly set with pale-green, branching tubercles. The head is small, pale yellowish-green, with a dark brown dot on each side. This larva is usually found on the upper surface of the leaf.

On reaching maturity, which is usually from the middle to the end of June, the larva leaves the bush, and, descending to the ground, penetrates beneath the surface, and there constructs a little, oval, earthy cocoon, mixed with silk and glutinous matter. These cocoons are toughly made, and may be taken out of the earth in which they are embedded, and even handled roughly, without much danger of dislodging the larva. They remain within the cocoon for a considerable time unchanged, finally transforming to chrysalids, from which the flies escape early in the following spring.

ARTICLE V. ON THE AUTUMN LIFE-HISTORY OF CERTAIN
[LITTLE-KNOWN PLANT-LICE.]

The plant-lice form one of the most destructive families of American insects; and at present we know of no satisfactory way of fighting a large number of them—a fact which is due largely, however, to the incompleteness of our knowledge of the group. For, as I have elsewhere said, "though much has been written concerning these insects, comparatively few species have been described in more than one or two of their several forms; and with a few notable exceptions, almost none of the authors who have described species have attempted to trace their seasonal life-histories. Doubtless this condition of things is due largely to the obscurity

surrounding the subject, and the imperfect knowledge of the economy of the group both in this country and Europe, as well as the difficulty of preserving specimens in satisfactory condition for study. The recent researches of Lichtenstein, and Kessler in Europe, and of Riley, Forbes, and others in this country, have given us, however, a substantial working basis for the tracing of the life-histories of these insects, and our knowledge ought hereafter to make more satisfactory progress." *

I. THE CURRANT PLANT-LOUSE. †

Myzus ribis Linn.

Order HEMIPTERA: Family APHIDIDÆ.

Notwithstanding the abundance and destructiveness of this species, its life-history does not seem to have been traced, nor the sexed forms described.

During the past season I observed the habits of the species which was abundant on the currant bushes in my garden, finding that the winged lice leave the bushes early in summer, but I was unable to discover to what plant they migrated. In September and October winged viviparous females returned to the currants and gave birth to young, which developed into oviparous females. The winged males flew in from some other plant, presumably developing with the migrating viviparous females, which gave birth to the oviparous form.

DESCRIPTIVE.

As the male and female forms have, so far as I can learn, not been described, the following descriptions, drawn up from living specimens, will be of interest to entomologists:

WINGED MALE.

Length of body.....	2.00 mm
Length of antennæ.....	2.70 mm
Length of cornicles.....	.50 mm
Wing expanse.....	8.50 mm

Antennæ, head, band on dorsum of prothorax, row of dots on each side of dorsum of abdomen, and transverse patch back of middle of same, black. Legs very long, with coxæ, apical half of femora, and apical fourth of tibiæ, together with tarsi, black, the rest being yellow. Cornicles long, slender, slightly incrassate. Antennæ about $\frac{1}{2}$ longer than body, slender, roughened with numerous sensoria; joint I large, thickened, about as long as II; III longer than any except VII; IV and V subequal; VI shorter than

* Psyche, vol. V., page 123.

† The descriptions here given of this and the following species were first published in Psyche, vol. V, pp. 208-210.

V; VII very long and slender. Cauda minutely tuberculate, with several curved stiff hairs arising from the margin.

Described from several specimens taken on under surface of cultivated currant leaves, 31 October, 1888.

OVIPAROUS FEMALE.

Length..... .75 mm to 1.00 mm.

Body globose; greenish, shade varying with age of specimen. Antennae, pale at base, but blackish apically and at articulations. Legs pale, articulations and tarsi dusky, and the thickened posterior tibiae greenish brown. Antennae short, less than half the length of the body; 6-jointed; joints I and II short, subequal; III and VI subequal, both longer than any of others; IV and V subequal, each about $\frac{1}{2}$ shorter than III; joints III to VI strongly tuberculate, having numerous sensoria. Cauda long and large, spinosely tuberculate, with several long curved hairs arising from its dorsal surface. Rostrum reaching posterior margin second coxae.

Described from many specimens taken on under surface of leaves of cultivated currant, 31 October, 1888.

In some specimens two large eggs were plainly visible. I did not find the eggs *in situ*, but there is little doubt that they are deposited on the twigs, especially about the buds.

2. THE WILLOW GROVE PLANT-LOUSE.

Melanoxanthus salicti Harris.

Order HEMIPTERA : family APHIDIDÆ.

This species was first described by Dr. Harris in his Treatise on Insects Injurious to Vegetation as *Aphis salicti**. In the Flint edition of the Treatise, however, Mr. Uhler states, in a foot-note, that the specific name had been "long ago appropriated by Shrank to a very different species of *Aphis* inhabiting Europe," and suggests that the American species "might be called *Aphis salicicola*."

The insect was again briefly discussed as *Lachnus salicicola*, by Dr. Cyrus Thomas in 1878;† and finally in his Synopsis of the Aphididæ of Minnesota‡ Professor O. W. Oestlund refers the species to *Melanoxanthus* and restores the name originally given by Harris, which, he says, "is not occupied when applied to this genus."

The only forms of the species as yet described are the viviparous ones.

My observations upon the insect began in October, 1888, when I found it very abundant on the twigs of willow (*Salix* sp.) growing in the bottoms of the Olentangy river on the Station farm. The sexed forms

*1st ed. 1842, pp. 190-191; 2nd ed., 1852, pp. 208-209; Flint ed., 1862, p. 239.

†8th Rept. St. Ent. Ill., pp. 115-116.

‡Geol. and Nat. Hist. Surv. Minn., Bull. No. 4, p. 36.

were present in great abundance, and could be seen mating, while many of the females were busily engaged in oviposition—the eggs being laid on the bark of the twigs, especially about the buds.

DESCRIPTIVE.

The following descriptions were drawn up from living specimens:

WINGED MALE.

Length, tip of antennæ to tip of folded wings.....	7.50 mm.
“ of body	2.50 mm.
Wing expanse	9.00 mm.

Body small; bluish-black, with glaucous bloom. Legs very long, hairy; coxæ unicolorous with body, femora and proximal $\frac{1}{2}$ – $\frac{3}{4}$ of tibiæ reddish brown; apical portion of tibiæ, together with tarsi, black. Antennæ long, hairy, black throughout; joints I and II short, subequal; III long, $\frac{1}{2}$ longer than IV, which is also about $\frac{1}{2}$ longer than V; VII slightly longer than VI; joints III to VII roughened with numerous sensoria. Cornicles vasiform. Prothorax with a blunt tubercle on each side. Wings hyaline; veins brownish; wing insertions generally greenish-black.

Described from numerous specimens taken on twigs, *Salix* Sp., 29th October, 1888. Some of them seen in copulo with oviparous females.

OVIPOROUS FEMALE.

Length of body.....	3.00 mm.
Width “ “ across abdomen.....	1.50 mm.

Body bluish-black, with a glaucous bloom. Legs hairy: coxæ unicolorous with body; femora, and proximal $\frac{1}{2}$ – $\frac{3}{4}$ of tibiæ yellowish brown; apical portion of tibiæ, together with tarsi, black. Antennæ hairy; joints I and II unicolorous with body, proximal $\frac{3}{4}$ – $\frac{1}{2}$ of III yellowish-brown, and the remainder black: joints I and II short, subequal; III longest of any but shorter than IV + V; IV slightly longer than V; VI and VII subequal: V, VI and VII roughened with numerous sensoria. Prothorax with a blunt tubercle on each side. Cornicles, short, vasiform, flanged at tip; orange-yellow. Rostrum blackish, reaching anterior margin posterior coxæ.

Described from many specimens collected on twigs *Salix* Sp., 29th October, 1888.

Egg—Length 1 mm., oval, greenish at first, but becoming black in a short time. Deposited on bark of twigs, especially about the buds.

ARTICLE VI.—NOTES ON VARIOUS INSECTS AFFECTING GARDEN CROPS.

THE CABBAGE PLUSIA, OR GREEN LETTUCE WORM.

Plusia brassicæ, Riley

Order LEPIDOPTERA: family NOCTUIDÆ.

This insect, illustrated in its various stages at figure 5, has been known for years to do serious injury to a number of garden crops, especially cabbage. It has frequently been treated of in our entomological literature, being discussed at some length by Dr. Riley in his report as entomologist to the U. S. Department of Agriculture for 1883 (p. 119), and again by Mr. Wm. B. Alwood in the report of this Station for 1886 (pp.



Fig. 5.

THE CABBAGE PLUSIA [after Riley.]

214-215). Its injuries have been quite severe the present season in Franklin county, and it has been reported from various other parts of the State. An especially complete and accurate account of its history and injury was received from Mr. Willard Barringer, proprietor of the Dayton View Gardens, Dayton, O., from the many interesting details of which I extract the following:

My attention was first called to the green lettuce worm (as generally called) about four years ago, when I first observed it upon lettuce and endive plants. Now, however, they are seriously injurious to cabbage, lettuce, celery, endive and sage, and to-day I found them on chrysanthemums and dahlias. I enclose you worms about one-half grown and full-grown, also as it is entering the chrysalis state. In the latter case you will observe that the worm seems to have turned into an innumerable number of small eggs or embryo chrysalids, I know not which. When working on the lettuce they first commence in the heart, and work from the under part upward until the stalk is destroyed, or rots from the accumulated excrement of the worm. In cabbages they bore completely through to the heart, and work all through the head like the cutworm and unlike the cabbage worm, which mostly works from the outside. In celery it attacks the tips of the tallest leaves or stems, and eats one up completely before going to another stem, but as it is a ravenous feeder it soon devours the plant. Often as many as six or eight worms are found on a single plant, while they will average three to a plant.

When working on sage they eat small oblong holes in the oldest leaves, seeming to avoid the young leaves for some reason. They work most when the nights are warm and moist, and are very active and destructive in warm, cloudy weather. When cool nights arrive they may be found at the center of the plant, or beneath it among leaves and rubbish. When disturbed while feeding, the caterpillar either falls off the leaf, or throwing its body, with the exception of the hind parts, out straight from the leaf, it will remain in that position quite a while; and as its color is very similar to that of the plant upon which it feeds, it will take a sharp eye to detect it. The quickest method of finding it is to look for a mutilated leaf, or by noticing the pellets of excrement, which are about the size of No. 10 shot, and generally lodge below the pest, leaving a brownish or dark stain. These worms will stand a right sharp frost, and conceal themselves in the heart on cold nights, so that they are frequently put away with celery in winter quarters, and destroy every vestige of leaf when so confined. I have never seen them before the middle of June, nor observed the moth which lays the eggs before June 1, until this year, when I first noticed them May 27. The moth is nocturnal in habits, and when disturbed flies so rapidly that it can scarcely be seen. They begin to work about sundown, although I have seen them laying their eggs during dark, cloudy days. They seem to deposit but one egg at a time, and go from tip to tip very rapidly. The specimens sent are not very perfect, as I found it almost impossible to capture one and not destroy the fine fuzz or down encasing their bodies. There is little difference in appearance between the male and female. I send one of each.

Both the moths and larva sent by Mr. Barringer proved to be the species under consideration, and his observations upon the behavior of the insect are very interesting. The "eggs or embryo chrysalids" found in the pupæ sent proved to be the pupæ of a very small parasite, which preys upon the insect. Some of these parasites were reared, being *Copidosoma truncatellum* Dalman, as kindly determined for me by Dr. C. V. Riley, who states that 2,528 of these parasites have been known to inhabit a single worm. From a careful examination of some of Mr. Barringer's specimens, I should think they contained an equal number of these minute destroyers.

2. THE STRIPED VINE BEETLE.

Diabrotica vittata, Fabr.

Order COLEOPTERA: family CHRYSOMELIDÆ.

This insect is exceedingly destructive over a large section of the State, especially in regions where melons are extensively raised. When very abundant its injuries are difficult to prevent by the usual applications of lime and plaster, or dilute mixtures of London purple or Paris green, as the beetles forsake the leaves so treated and do a more serious injury by attacking the plant stems at and often beneath the soil-surface. Apparently the only practical way to prevent their injuries is to exclude them by mechanical means—such as covering the young plants with pieces of thin muslin, the edges of which are held in place by earth, or

putting gauze-covered frames over them. Many melon-growers have adopted one of these methods, and in some regions immense quantities of muslin are used in so protecting the plants. Of course after the vines have got a good start they are able to shift for themselves.

3. THE CELERY WORM.

Papilio asterias, Cram.

Order LEPIDOPTERA: family PAPILIONIDÆ.

My attention has frequently been called by correspondents and others, during the past autumn, to the handsome, golden-banded caterpillar shown in fig. 6. It is the larva of the beautiful swallow-tailed butterfly, black with golden-yellow spots on the wings, shown above it in the illustration, which has been reproduced (and reduced) from a drawing made many years ago by Townsend Glover, and lately published in a bulletin from the U. S. Department of Agriculture. The butterfly is called by naturalists *Papilio asterias*—the Asterias Butterfly. Besides celery, the caterpillar feeds upon leaves of carrots, parsnips, and related plants, sometimes doing considerable damage. When full-grown it seeks some concealed nook and changes to a chrysalis (shown at the right of the figure) and in due time emerges as a butterfly. The caterpillar has two golden-yellow horns concealed just above the head, which are thrown out and emit an offensive odor when the insect is disturbed.



Fig. 6.

THE CELERY WORM.

Mr. Barringer, extracts from whose letter are printed above, in sending one of these caterpillars, taken from celery, for identification, says:

When touched it protrudes from the top of its head two soft yellowish "antennæ" that throw off a sickening smell. I presume it uses them as a means of defense, as I never knew these caterpillars to be eaten by fowls or birds. I have thrown them among chickens in the coops, but they refuse to touch them, while they eagerly devour the green-worm (*Plusia brassicae*), and even hunt them up, as does also the English sparrow.

ARTICLE VII.—HEAT AS A REMEDY FOR PEA AND BEAN WEEVILS.

Bruchus pisi Linn. and *B. obsolctus* Say.

Order COLEOPTERA: family BRUCHIDÆ.

These two pests are the most injurious insect enemies of the crops which they respectively attack, and in some portions of the country have almost put a stop to their production.

The Pea Weevil is distributed over a large portion of the United States, and is liable to be introduced wherever seed is imported from other localities. The adult beetle deposits small yellow eggs on the outside of the young pea pods early in summer. The grubs or larvæ soon hatch and eat their way through the pods to the partially developed peas within. They also eat into these and remain feeding on their substance, rarely or never, however, injuring the radical or point of germination. When the larva becomes full-grown it eats to the surface of one side of the pea, but does not pierce the thin outer skin. It then becomes a pupa, and after some time emerges as an adult beetle. Some of the beetles leave the peas in autumn, but many stay in them until the following spring.

The Bean Weevil, illustrated in fig. 7 resembles the pea weevil in general appearance, and the life-histories of the two species are much alike. The eggs are deposited on the growing bean pods, and the larvæ on hatching bore through to the young seeds and attack them, several larvæ sometimes attacking a single seed. They remain in the beans all summer, pupating before autumn. A portion become adult beetles the same season, while others do not complete their transformation until the following spring.

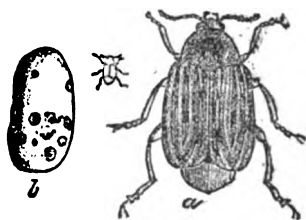


Fig. 7.

THE BEAN WEEVIL.

REMEDIES.

The direct remedies which have as yet been recommended to destroy these insects relate, so far as my information goes, to the destruction of the adult beetle alone, or at least to the destruction of the insect after it has done most of its damage. From a suggestion made by Professor W. R. Lazenby, I was led to examine a number of newly-ripened peas about the middle of July, and found that the larvæ or grubs were as a rule only about half-grown. Consequently they had done only about half the damage to the peas that they would do before winter; and hence if they could

be destroyed at this time without injury to the germinating powers of the peas, the value of the latter either for food or seed would be greatly enhanced.

The simplest method of destruction seemed to be by heat. Accordingly experiments were made to learn whether there was a degree of heat which would destroy the larva without injuring the germinating quality of the seed, and it was found that by exposure for one hour to 145° Fah. this result was obtained. In conducting the experiments an ordinary gasoline stove-oven was used, with a lighted kerosene lamp beneath it. Only a very small flame is needed to produce the required amount of heat. To be of most benefit this remedy must be applied as soon as possible after the peas are fully ripe. By its use a large part of the edible portion of the seed will be saved, the injury to the germ much lessened, and the dissemination of the insects prevented.

I had no opportunity of experimenting with this remedy for the Bean-Weevil, but presume it can be also applied to it.

ARTICLE VIII.—ON THE CHINCH BUG IN OHIO.

Blissus leucopterus Say.

Order HEMIPTERA: family LYGÆIDÆ.

Probably the most important entomological event in Ohio during the season was the destructive appearance of the chinch-bug in many parts of the State. Although the insect was present last year in at least ten counties—it having been reported to the United States Statistician as doing some injury in 1887 in Defiance, Wood, Geauga, Allen, Darke, Shelby, Franklin, Fairfield, Meigs and Gallia counties—the outbreak this year was much more severe than for many years past, very serious injury being done by it in Allen, Mercer, Franklin, Fairfield, Pickaway, Fayette, Meigs, Gallia and Lawrence counties.

This insect has been so frequently and fully discussed in recent entomological literature, that only a few points of special interest will be touched upon in this article. Readers desiring further information will find an excellent summary of what is known about the chinch-bug in the Report of the U. S. Department of Agriculture for 1887, pp. 51–88.

LIFE-HISTORY.

Under this head I cannot do better than quote the following brief summary from the pen of Professor S. A. Forbes:

The chinch-bug passes the winter in the adult winged state (a few black wingless individuals occasionally occurring), under rubbish or around the fields, in corn-shocks

and straw-piles, under boards and among dead leaves in the woods, most abundant, usually, around the edges of the fields and in thickets, and around the borders of woods. From these lurking places such as survive the winter emerge in April and May (possibly sooner, if the season opens early), and, after pairing, lay their eggs, in May and June, in fields of spring and winter wheat, barley, rye, oats and corn—chiefly in wheat and barley—most of the eggs being deposited in or near the ground, on the lower parts of the plants. Many of those hibernating around fields sown to wheat and barley make their way in on foot, thus attacking the outer edges first; but others take wing and scatter freely wherever suitable food invites them.

By July most of the old bugs will be dead, and the new brood will be nearly full-grown,—far enough advanced by harvest to abandon the wheat fields for the nearest available food—oats or corn, if these are adjacent—otherwise and more rarely grass. Making their way in on foot, only the borders of these fields will be at first attacked; but later, by the 1st of August at the farthest, the bugs not already located will begin to fly, and so will become generally disseminated through fields of corn. Here the eggs are laid behind sheaths of the lower leaves, and under the protection of this retreat the young hatch and mature, only coming out upon the exposed surfaces of the leaves when they become superabundant or when they get their growth. The full-grown bugs fly freely, singly but not in swarms, whenever their food fails them where they are. Rarely we find in the southern part of the State some trace of a third brood in a season, the young of these appearing in September in the corn—but these are in too small numbers to have any practical importance. The broods are mainly two, one breeding chiefly in wheat, and the other almost wholly in corn, the adults of this latter brood passing the winter as above described.

Each female is believed to be capable of laying about five hundred eggs.

The chinch-bug is practically confined for food to the great family of grasses (*Gramineæ*), which contains all the cereals and grasses, tame and wild. Some of these, however, it feeds upon with reluctance, if at all; and among the ordinary objects of its food it has its very decided preferences. Among the crop plants, wheat, barley and rye, sorghum, broom-corn and Indian corn, millet and Hungarian grass are its favorite foods, with oats clearly second to these; while among the wild grasses, its preference is for fox-tail grass and "tickle grass" (*Setaria* and *Eragrostis*.) * * * Nothing seems more precisely to its liking than the *Setarias* (fox-tail, Hungarian and millet,) unless it be sorghum and broom-corn.

APPEARANCE OF CONTAGIOUS DISEASES.

Over a large portion of the region in which chinch-bugs were destructive in 1888 there appeared certain fungous and bacterial diseases which destroyed the pest by millions. These diseases have been studied in Illinois by the State Entomologist, Professor S. A. Forbes, in Iowa by Mr. C. P. Gillette, Entomologist of the Experiment Station, and in Minnesota by Dr. Otto Lügger. In these three States the numbers of the bugs have been so diminished that there is little fear of injury next year.

The chinch-bug disease which has attracted the most attention the past summer is due to fungus, which is illustrated in fig. 8. There are two kinds of fungi affecting the bugs in this way; one belonging to a genus called by botanists *Entomophora* and the other to *Botrytis*. The bugs affected by both are covered when dead by a whitish efflorescence, consisting largely of what is called the *mycelium* of the fungus, which some-

times is so dense as wholly to hide the victim from view. An idea of the value of the disease to the farming community may be obtained from the following account of its work in Minnesota, as given by Dr. Otto Lugger, Entomologist to the Minnesota Experiment Station, in a recent bulletin. After speaking of the first appearance of the disease Dr. L. continues:



Fig. 8. Diseased Chinch-bugs.

Enlarged specimen to show fungi penetrating through the skin covering it; others natural size killed by the disease. (After Lugger.)

It spreads very rapidly to adjoining fields of timothy, Hungarian grass, millet, etc. Even the course followed by it from the holes could be readily recognized for some time by the more or less numerous white spots left in its wake. The fields invaded by the disease afforded, upon closer examination, a truly edifying spectacle to those not interested in the welfare of the chinch-bugs. They looked quite panic-stricken, and moved about in a slow and dazed way, figuratively speaking, as if badly scared. And well they might be! The victims of the disease could be seen everywhere by the thousand; they had been slaughtered in all kinds of positions, but they were usually fastened to the blades and stems of the grass, or to the leaves of young clover. All showed plainly that their last and strong determination in life had been to hold on as long as possible; their legs were firmly planted upon the substance where the bug happened to be; others had only their beaks inserted and were dangling by it free in the air. But all showed the characteristic white mycelium threads and spores of the disease. The accompanying illustration shows an enlarged chinch-

bug, with white threads issuing from its body, and numerous other specimens in natural size, killed by the fungus. Most, if not all chinch-bugs, would have been killed at the Experiment Station, if suitable conditions for this disease had lasted a few days longer. But the wet spell prevailing part of the time the disease was playing such havoc among the bugs soon passed and was followed by warm and very dry days, which soon stopped any farther increase of the disease. But by artificially producing such conditions the disease was kept at work for some time, though only on a very limited scale. Nor could it be spread, because in nature such artificial conditions could neither be produced nor maintained on an extensive scale.

After an exhaustive investigation, Professor S. A. Forbes, State Entomologist of Illinois, writes:

It now seems likely that these diseases, occurring as they do spontaneously over a large area, will soon suppress what has probably been the longest-continued destructive outbreak of the chinch-bug known in the history of that insect. Their present activity is illustrated by the fact that in a single field in southern Illinois dead chinch-bugs imbedded in this mold were found so numerous as to suggest a recent flurry of snow.

These diseases, at least in part, have appeared in Ohio, and I hope have and will check the bugs sufficiently to prevent serious injury next year, although my present information is not sufficient to indicate to what extent they have already been destroyed over the infested area. In

Franklin county I have found the dead insects imbedded in the fungus very plentifully, and live bugs early in winter were comparatively scarce in situations where they would naturally occur.

EXPERIMENTS WITH REMEDIES.

The most successful experiment tried at the Station in preventing the injuries of the chinch-bug was that of stopping the migration of the young by a barrier of coal tar. In one field the bugs had developed abundantly in wheat, and when that was cut, prepared to attack a patch of oats adjacent. We made a shallow V-shaped trench with the corner of a hoe between the two parts of the field, and then filled it with tar. The tar first applied soon dried on the sides of the trench, forming an impervious coating, through which subsequent coatings did not pass, after which it was necessary to renew the tar only once in two or three days. As long as the tar was sticky the bugs did not cross it, and in this way we protected the oat-field from invasion until the crop was ripe. Pits dug at intervals along the trench served to catch the bugs.

We also tried plowing the young bugs under, immediately after harvest, with partial success. After plowing, the ground was rolled. The effectiveness of this remedy depends largely upon the dampness of the soil. If this is sufficiently moist to be well packed, very few bugs will go through it, but if it is dry and dusty, many will escape.

ARTICLE IX. ON TWO POTATO INSECTS.

I. A NEW ENEMY TO THE POTATO. THE IMBRICATED SNOUT BEETLE.

Epicærus imbricatus Say.

Order COLEOPTERA : family OTIORHYNCHIDÆ.

To the already long list of potato beetles I have to add this species, which I received early In June from Mr. J. P. Coulter, of Cramer, Ill., who, in the accompanying letter, wrote :

"I send to-day a species of bug that is in great numbers on our potatoes, and fully as destructive as the Colorado potato beetle. They are new to us. Their manner of operating is about the same as the other, except that they probably cut the stalk off more frequently, and very generally cut off the upper part with the soft, undeveloped leaves."

PAST HISTORY OF THE INSECT.

Originally described in 1823 by Thomas Say, no mention of the insect as an injurious species seems to have been made until 1872, when Dr.

Riley noted in his third Missouri Report (p. 58) that the beetle frequently injures apple and cherry trees, and gooseberry bushes by gnawing the twigs and fruit.

No additional information concerning the species appeared until 1880 when Professor J. H. Comstock (Rept. U. S. Dept. Agr., 1879, p. 249) reported the receipt of specimens from Tennessee with accounts of serious injury to garden crops—onions, radishes, cabbage, beans, watermelons, muskmelons, cucumbers, squashes, beets and corn being the crops attacked.

During the same year Dr. Riley noted (Am. Ent. v. III, p. 200) that the beetles were also injuring cabbage in Delaware.

In 1883 Professor S. A. Forbes announced (12th Rept. St. Ent. Ill. p. 104) that the beetles had been observed feeding on blossoms of red clover; and three years later the same gentleman reported (Misc. Essays Ec. Ent. 1886, p. 21) that the beetles feed on pear leaves, and that the eggs had been found between pear leaves stuck together by their opposed surfaces.

ITS LIFE-HISTORY UNKNOWN.

Although this beetle is distributed over a large portion of the United States, its early stages have never been described. The only definite clue that we possess is found in the last article cited above, in which Professor Forbes reports that the slender white eggs were found between pear leaves; and one of his correspondents states that the beetles had been observed with their heads just sticking out of the ground, as if the earth had not been broken above them. Besides this, Professor Riley has conjectured that the larvæ will be found to feed externally on the roots of one or more of the food plants of the adult beetle.

The Imbricated Snout beetle is illustrated at fig. 9. It is about half an inch long, silvery-white in general color, with various darker markings on its back. When alarmed it feigns death, resembling the Plum Curculio in this respect, and falls to the earth.

Should this insect become generally injurious as a potato beetle, it can probably be destroyed by applying Paris green or London purple to the vines.



Fig. 9.

2. NOTES ON THE COLORADO POTATO BEETLE.

Doryphora 10-lineata Say.

Order COLEOPTERA: family CHRYSOMELIDÆ.

This old-time pest appears to be again ascending the scale of destruction, for it was very abundant during the season and did much damage in many portions of the State. On the Station grounds the potatoes were

first sprayed June 20. The Nixon barrel machine was put in a wagon and the spray was distributed through a nozzle at the end of a long hose. A man in the wagon to pump and drive, and a boy on the ground to direct the spray, did the work rapidly and well. A half-pound of London purple to fifty gallons of water was the strength of solution used.

ARTICLE X. ON INJURIES OF THE SPOTTED GRAPE-VINE BEETLE.

Pelidnota punctata Fabr.

Order COLEOPTERA: family SCARABEIDÆ.

This insect has been known for years to attack grape-vines, but it has rarely been reported to do really serious injury to them, probably because it usually is present in such limited numbers that its depredations are insignificant. It seems, however, from the following letter received, last July, from Mr. W. C. R. Woodruff, of Dresden, Muskingum county, Ohio, together with specimens of the beetle, that the insect is really a formidable foe when it does appear above the danger line:

At the suggestion of Mr. M. Crawford, of Cuyahoga Falls, I send you specimens of the gratest enemy to grape-growing in this vicinity. I have been growing grapes for fifteen years, and have never known any insect to injure them except this bug. I have tried several times to prevent them, but without effect. The bugs begin work when the berry gets nearly its full size, and works rapidly, going through the whole vineyard in the course of ten or fifteen days. They have been with me this season now [July 13] about ten days, and have stung at least one-half the crop, and I had a good stand. They are worse some years than others, but there are some every year. Generally they sting the berry only once. When first stung it has the appearance of a "hive" coming on one's hand. It then begins to spread, being at first yellowish, then turning darker, and dries up black, sometimes falling to the ground, and sometimes remaining on the stem. The bugs fly in the night, and are hard to find in the day-time. I send also some injured grapes.

The supposed "stinging" of the grapes had apparently been done by the jaws of the insect. Many of the specimens sent showed a peculiar injury, looking as if they had been bitten by the beetle, and some of the juicy pulp extracted. This habit of the species has not, I believe, been before noticed—at least no mention is made of it in the standard articles I have had the opportunity to consult.

THE INSECT'S LIFE-HISTORY.

The larva of the Spotted Grape-vine Beetle feeds on the decaying roots of various trees, and resembles somewhat the common white grub of meadows—the larva of the May beetle. Its general color is whitish, with the head chestnut-brown. It is supposed, to require three years to complete its development. When full-grown it forms a sort of cocoon, within which it changes to the chrysalis or pupa state, to emerge about a fortnight later as an adult beetle.

The general color of the upper surface of the beetle is a dull yellowish-brown, but the thorax is darker, and somewhat bronzed; and the under surface is of a brilliant metallic, greenish-black hue. There are three distinct black dots on each of the wing covers, and also one on each side of the thorax. The beetle usually feeds upon the foliage of wild and cultivated grape-vines, and also on the Virginia creeper.

REMEDIES.

The only practical remedy so far proposed is that of collecting the beetles by hand and destroying them. As they fly especially just at dusk this is the best time for the work.

ADDENDUM.

ARTICLES PUBLISHED BY THE ENTOMOLOGIST DURING THE YEAR.

It has been thought desirable to bring together, in this connection, a record of the articles published by the Entomologist during the year, as most of the points brought out in the work of the Division have been first announced through the agricultural press, and a record of such announcements is frequently needed for reference. Each entry has been made complete in itself, in accordance with the most approved bibliographical methods.

TECHNICAL ARTICLES.

1888. WEED, CLARENCE M. On the occurrence of apterous males among the Aphididæ. (*American Naturalist*, v. XXII, p. 70; Jan., 1888.)

Records discovery of apterous males among certain plant-lice (*Aphididæ*) in which this form had not before been known to occur. Species mentioned are *Schizoncra cornicola*, *Aphis maidis*, and an unknown species of *Aphis*.

1888. WEED, CLARENCE M. On the synonymy of the apple-leaf creaser, *Ornix geminatella* (Pack). (*American Naturalist*, v. XXII, p. 364; April, 1888.)

Discusses literature of *Ornix prunivorella* Chambers, and *Lithocolletis geminatella* Packard, with the conclusion that the two are the same, and hence that the insect should be known as *Ornix geminatella* (Packard).

1888. WEED, CLARENCE M. On the parasites of the honeysuckle sphinx, *Hemaris diffinis* Boisd. (*Entomologica Americana*, v. IV, p. 147; Nov., 1888.)

Paper read before the Entomological Club, Am. Assoc. Adv. Science. Two primary parasites of *Hemaris diffinis* recorded, viz.: *Rhogas fumipennis* Cress, and an undescribed variety of *Apanteles limenitidis* Riley. A secondary parasite of the *Apanteles* is a species of *Hemiteles*, apparently undescribed.

1888. WEED, CLARENCE M. On the Hymenopterous parasites of the strawberry leaf-roller, *Phoxopterus comptana*, Fröl. (*Entomologica Americana*, v. IV, p. 149, Nov., 1888.)

Paper read before Entomological Club, Am. Assoc. Adv. Science. Two new species—*Cremastus cookii* and *Glypta phoxopteridis*—described as parasitic on the leaf-roller named.

1888. WEED, CLARENCE M. Biological notes on some North American Ichneumonidæ. (*Psyche*, v. V, pp. 51-53; May, 1888.)

Notes on the hosts and breeding habits of the following parasites: *Pimpla notanda*, *P. annutipes*, *P. conquisitor*, *P. inquisitor*, *P. alboricta*, *Glypta vulgaris*, *G. simplicipes*, *Trogus obsidianator*, *T. exesorius*, and *Ichneumon rufiventris*.

1888. WEED, CLARENCE M. Contribution to a knowledge of the autumn life-history of certain little-known Aphididæ. (*Psyche*, v. V, pp. 123-134, Nov.-Dec., 1888.)

Notes on autumn history, and description of sexed forms of *Aphis cornifolia* Fitch., *Siphonophora rudbeckiæ* (Fitch.), *Schizoneura cornicola* (Walsh), *Callipterus discolor* Monell, *Chaitophorus viminalis*, Monell, and an unknown *Aphis*.

1888. WEED, CLARENCE M. Description of some new or little known Microgasterinæ. (*Trans. Am. Ent. Soc.* v. XV, pp. 294-297; Dec. 1888).

Descriptions of three new species—*Microplitis maturus*, *M. terminatus*, and *Microgaster facetosus*; also redescriptions of *Apanteles hallii* (Pack.), *A. lunatus* (Pack.), *A. carduicola* (Pack.), and *Microgaster zonaria* (Say).

ECONOMIC AND POPULAR ARTICLES.

1888. WEED, CLARENCE M. The spring and summer treatment of apple orchards to prevent insect injuries (*Ohio Agr. Exp. Stat., Bull.* No. 3, Sec. Series, pp. 25-38; figs. 1-10.)

Extract under title "Fighting Apple Insects" in *Prairie Farmer*, 12th May, 1888.

Abstract by Professor L. H. Bailey in *American Garden*, v. IX, p. 344; Sept., 1888.

A summary of the life-histories of insects affecting apple, and practical treatment of them under the following heads: Introduction. Affecting the trunk. Affecting the foliage. Affecting the fruit. Insecticide apparatus. Spraying nozzles. Chronological summary.

1888. WEED, CLARENCE M. Experiments with remedies for the plum curculio (*Ohio Agr. Ex. Stat., Bull.* No. 3, Sec. Series, p. 38).

Reprinted in *Prairie Farmer*, 12th May, 1888.

Abstract by Professor L. H. Baily in *American Garden*, v. IX, p. 344; Sept., 1888.

Recommends for trial the following methods of preventing curculio injuries: Spraying with arsenites; dusting with lime; and mixing trees of American and European varieties.

1888. WEED, CLARENCE M. Experiments in preventing curculio injury to cherries. (*Ohio Agr. Ex. Stat., Bull.* No. 4, pp. 39-52).

Extract under title "Curculio and Injury to Cherries" in *Prairie Farmer*, 11 Aug., 1888.

Summary and conclusions republished under title "Plum Curculios" in *Orange Judd Farmer*, 8th Sept., 1888.

An elaborate series of experiments, from which the following preliminary conclusions were reached:

- (1.) That three-fourths of the cherries liable to injury by the plum curculio can be saved by two or three applications of London purple in a water spray.
- (2.) That if an interval of a month occurs between the last application and the ripening of the fruit no danger to health need be apprehended from its use.
- (3.) That lime is not so certain in its preventive effects as London purple, saving in these experiments only forty per cent. of the fruit liable to injury.

1888. WEED, CLARENCE M. The chinch-bug in Ohio: midsummer remedies. (*Ohio Agr. Exp. Stat., Bull.* No. 4, Sec. Ser., pp. 53-55).

Reprinted under title "The Chinch-bug in Ohio" in *Ohio Farmer*, 28th July, 1888.

Announces presence of chinch-bug in destructive numbers in Ohio, and recommends following remedies; Plowing; burning; coal tar as a barrier to migration; kerosene emulsion; trapping in furrows. Requests information as to distribution.

1888. WEED, CLARENCE M. Some experiments in preventing the injuries of the plum curculio (*Conotrachelus nenuphar* Herbst). (*Proc. Soc. Pro. Agr. Sci.*, 1888, pp. 90-95).

A concise account of experiments made in summer of 1888, with conclusions that three-fourths of curculio injury may be prevented by spraying with London purple.

1888. WEED, CLARENCE M. Poisoning the plum curculio. (*Am. Nat.*, v. XXII, pp. 1,036-1,037; Nov. 1888.)

Reports that a large portion of a green plum confined in a breeding cage with an adult curculio was eaten, and that Forbes finds that these beetles also eat plum leaves. Hence thinks that when trees are sprayed with poison the beetles are killed.

1888. WEED, CLARENCE M. Notes on Cutworms. (*Ohio Farmer*, v. 74, p. —; 19th May, 1888.)

Summary of life-history of the group. Remedies recommended are: use of poisoned baits, trapping under boards, and digging out.

1888. WEED, CLARENCE M. Seasonable insect notes. (*Ohio Farmer*, v. 74, p. —; 16th June, 1888.)

Notes on injuries of plant-lice, raspberry slug (*Selandria rubi*) and canker-worm. Specimens of the white-winged Bibio. (*B. albipennis*) received from correspondent who supposed them injurious; said to be harmless. Request for insects.

1888. WEED, CLARENCE M. The Clover Seed Midge. (*Ohio Farmer*, v. 74, p. 18; 14th July, 1888. Re-published in *Prairie Farmer*, v. 60, p. —; 11th Aug., 1888.)

In answer to queries of an Ohio correspondent summarizes life-history of clover-seed midge (*Cecidomyia leguminicola*). Recommends early cutting of first crop of infested fields, or pasturing it off, as remedies. Requests information as to presence in other parts of the State.

1888. WEED, CLARENCE M. Notes on Ohio Insects. (*Ohio Farmer*, v. 74, p. 66; 4th Aug., 1888.)

Injuries of chinch-bug in Ohio. Discussion of supposed injury to melon vines by it. Injuries of plum curculio less than usual because of parasites. Mention of presence of clover-seed midge in Lake county, Ohio, and of its parasites.

1888. WEED, CLARENCE M. A new clover pest. (*Ohio Farmer*, v. 74, p. 179; 22d Sept., 1888.)

Announces the presence, in injurious numbers, of clover root borer (*Hylastes trifolii*) in Stark county, Ohio. Article by Riley (Rept. U. S. Dept. Agr. 1878, pp. 248-250), quoted at length.

1888. WEED, CLARENCE M. Recent developments in insect warfare. (*Ohio Farmer*, v. 74, pp. 230, 246; 6th, 13th, 20th Oct., 1888; figs.)

Discussion of life-histories, parasites, and classification of insects; improvements in insecticide apparatus; and summary of results obtained at the Ohio Agricultural Experiment Station in experimenting with remedies for the plum curculio (*Conotrachelus nenuphar*), rose-beetle (*Macrodactylus subspinosus*) and currant-worm (*Nematus ventricosus*).

1888. WEED, CLARENCE M. Hessian-fly—Smut—Clover-borer. (*Ohio Farmer*, v. 74, p. 275; 3d Nov., 1888.)

Occurrence of Hessian-fly pupæ in volunteer wheat in Wayne county, Ohio. Notes on abundance of fox-tail smut (*Ustilago neglecta*) in Ohio, and the injuries it might cause when eaten by stock; mention of clover root borer (*Hylastes trifolii*).

1888. WEED, CLARENCE M. Some fungi and insects. (*Ohio Farmer*, v. 74, p. 294; 10th Nov., 1888.)

Identification of spots on pear-leaves received from an Ohio correspondent as due to a fungus—*Morthiera mespili*. Notes on injuries of *Plusia brassicae* and *Papilio asterias*.

1888. WEED, CLARENCE M. The strawberry midget. (*Trans. Ill. St. Hort. Soc. for 1887*, pp. 230-233). First published in *Prairie Farmer*, 27th Aug., 1887, and re-published in *Popular Gardening*, v. III, p. 176; May, 1888.

Account of alarm caused by *Thrips tritici* in Illinois in 1887. Appeared in strawberry blossoms, and damaged crop by gnawing pistils so as to prevent fertilization. Notes on allied species. No remedy known. Advises planting a larger proportion of staminate varieties.

1888. WEED, CLARENCE M. The Tree Cricket. (*Ohio Farmer*, v. p. 74, 326; figs. 1, 2; 24th Nov., 1888).

Ohio correspondent sends eggs in grape-vine which are identified as those of the snowy tree cricket (*Oecanthus niveus*). Brief resume of life-history, with figures of adult and eggs, after Riley. If old patches of raspberries are to be cut down, it is advised that it not be done until winter, so that as many eggs of this insect may be destroyed as possible.

1888. WEED, CLARENCE M. Chinch-bug and its diseases. (*Ohio Farmer*, v. 74, p. 375; 15th Dec., 1888).

Account of chinch-bug diseases with announcement of appearance in Ohio. Quotations from Forbes and Lugger.

1888. WEED, CLARENCE M. Cherries and the curculio. (*Philadelphia Weekly Press*, 1st July, 1888.)

Announces conclusions reached in experiments in spraying cherry trees with lime water and London purple, to prevent injuries of plum curculio. Seventy-five per cent. of fruit liable to injury saved by spraying with London purple; about forty per cent. with lime; 22,500 cherries examined in conducting the experiment.

1888. WEED, CLARENCE M. Cicadas, or harvest flies, and beetles. (*Popular Gardening*, v. IV, p. 45.)

Resume of life-history of Cicadas, with figure of adults. Beetles sent by a Missouri subscriber, with accounts of injury to garden crops identified as a blister beetle. (*Pipicauda*.)

1888. WEED, CLARENCE M. Some notes on apple insects. (*Rural New Yorker*, v. XLVII, p. 333; 19th May, 1888.)

Economic notes concerning apple-tree borers and codling moth.

1888. WEED, CLARENCE M. Elementary talks about insects. (*Philadelphia Weekly Press*, 1st August, 1888.)

Popular discussion of the life-history of insects; and of the relations of parasitic species to the great body of insects.

1888. WEED, CLARENCE M. Dragon flies. (*Philadelphia Weekly Press*, 10th October, 1888.)

Short popular account of life-history and habits of dragon-flies (*Libellulidae*).

1888. WEED, CLARENCE M. Tree crickets. (*Philadelphia Weekly Press*, 17th Oct., 1888.)

Short popular account of injuries and life-history of tree crickets (*Oecanthus*.)

1888. WEED, CLARENCE M. A chapter on insecticides. (*Philadelphia Weekly Press*, November, 1888.)

Discussion of nature of, and methods of application of following insecticides: Paris green, London purple, White arsenic, Hellebore, Pyrethrum, kerosene emulsion, carbolic acid, bisulphide of carbon, benzine, gasoline, coal tar, lime, gas lime, plaster, soluble phenyle, and paraffine oil.

1888. WEED, CLARENCE M. Apple-tree borers. (*Prairie Farmer*, vol. 60, p. 3; 7th January, 1888; fig.)

In reply to a Nebraska correspondent, who reports injury to apple trees, a resume of the life-history of the flat-headed apple-tree borer (*Chrysobothris femorata*) is given. Remedies advised are, washing trunks with soft soap early in summer, and digging out borers in autumn.

1888. WEED, CLARENCE M. A chicken tick. (*Prairie Farmer*, v. 60, p. 3; 7th Jan., 1888.)

Arizona correspondent sends specimens, identified as an *Argas*, with accounts of injury to chickens. "They are secreted during the day, and at night get on the chickens, making small raw places about the size of a wheat grain, which in due time form a scab and heal up. The principal places of attack are the thighs and first joints of the wings. The chickens look badly and seem lifeless, having no color about their heads. The best remedy we have found so far is a saturation of coal oil."

1888. WEED, CLARENCE M. A cricket parasite. (*Prairie Farmer*, v. 60, p. 3; 7th January, 1888.)

Missouri correspondent reports finding a peculiar whitish worm, extending from abdomen of cricket, which author conjectures to be a species of *Mermis*. Brief account of life-history of *Mermis*.

1888. WEED, CLARENCE M. The cecropia emperor moth. (*Prairie Farmer*, v. 60, p. 375; 9th June, 1888.)

Cocoons sent by Dakota correspondent identified as those of *Platysamia cecropia*, the life-history of which is discussed. Figures of all stages but the eggs given.

1888. WEED, CLARENCE M. Questions answered. (*Prairie Farmer*, v. 60, p. 375; 9th June, 1888.)

Replies to correspondents concerning an unknown strawberry insect, chinch-bugs, and plum plant-lice.

1888. WEED, CLARENCE M. Growing sound apples. (*Prairie Farmer*, v. 60, p. 273; 28th April, 1888.)

Hope expressed that process of spraying orchards will be largely practiced during season just opening.

1888. WEED, CLARENCE M. Seasonable insect notes. (*Prairie Farmer*, v. 60, p. 273; 28th April, 1888.)

Notes on various insect remedies. E. Moody & Sons, Lockport, N. Y., report that plum cureulios may be destroyed by spraying with London purple.

1888. WEED, CLARENCE M. Notes afield. VI. How insects destroy each other. (*Prairie Farmer*, v. 60, p. 51; 28th Jan., 1888.)

Discussion of predaceous and parasitic insects, with figure of predaceous beetle.

1888. WEED, CLARENCE M. How to apply insecticides. [Extract from a farmers' institute address]. (*Prairie Farmer*, v. 60, p. 1888; 25th Febr., 1888.)

Directions for applying Paris green, London purple, pyrethrum, hellebore, kerosene mixtures, and tobacco.

1888. WEED, CLARENCE M. The clover hay worm. (*Prairie Farmer*, v. 60, Supp.; 5th May, 1888.)

Worms taken from clover hay by a correspondent identified as larvæ of *Asopia costalis*. Resume of life-history. Clover stacks should not be put in the same place year after year.

1888. WEED, CLARENCE M. The strawberry slug. (*Prairie Farmer*, v. 60, p. —; 14th July, 1888.)

Brief illustrated account of life-history.

1888. WEED, CLARENCE M. About "chigoes" or jiggers. (*Prairie Farmer*, v. 60, p. 506; 4th Aug., 1888. Figs.)

In reply to an Illinois correspondent, an account of the life-history of harvest mites is given.

1888. WEED, CLARENCE M. The tomato worm. (*Prairie Farmer*, v. 60, p. —; 11th Aug., 1888.)

Brief illustrated account of the tomato worm (*Phlegethontius celeus*).

1888. WEED, CLARENCE M. Recent entomological works. (*Prairie Farmer*, v. 60, p. 443; 7th July, 1888.)

Economic entomology making rapid progress. Brief notices of report on Economic Entomology of Tennessee; Bull. No. 17, Div. Ent., U. S. Dept. Agr.; Bull. XLVI of the Jersey Agr. Exp. Station, and a Bulletin of the Ill. St. Lab. Nat. History, by Professor S. A. Forbes, on the Food of Fresh-water Fishes.

1888. WEED, CLARENCE M. Questions answered. (*Prairie Farmer*, v. 60, p. 443; 7th July, 1888.)

An unrecognized attack on plums in Missouri. Red-shouldered Sinoxylon (*S. basillare*) received from Kansas, where it was reported to bore grape stems.

1888. WEED, CLARENCE M. A new potato beetle. (*Prairie Farmer*, v. 60, p. 412; 23d June, 1888.)

Correspondent in Illinois sends specimens of beetle injuring potatoes. Identified as the imbricated snout beetle (*Epicærus imbricatus*), and said to be a new enemy to potatoes.

1888. [WEED, CLARENCE M.] Fighting plant lice in autumn. (*Am. Garden*, v. IX, p. 431; Dec., 1888.)

Recommends destroying the egg-depositing brood of plant-lice on apple and other trees during October and November instead of waiting till spring. Experiments being carried on at Ohio Agricultural Experiment Station.

1888. [WEED, CLARENCE M.] White arsenic as an insecticide. (*Am. Garden*, v. IX, pp. 431-432; Dec., 1888.)

Abstract of Gillette's experiments with white arsenic at Iowa Agricultural Experiment Station. Hope expressed that this substance will no longer be recommended as an insecticide.

1888. [WEED, CLARENCE M.] The parsnip caterpillar. (*Am. Garden*, v. IX, p. 432; Dec., 1888.)

Brief illustrated account of *Papilio asterias*.

1888. [WEED, CLARENCE M.] The elm-leaf beetle. (*Am. Garden*, v. IX, p. 394; November, 1888.)

Reply to a correspondent, who had purchased a canker-worm trap to prevent injuries of elm beetle. Difference in life-history of the two insects indicated.

REPORT OF THE VETERINARIAN.

SIR: My connection with the Ohio Agricultural Experiment Station began on the first of July, 1888; but before that date, on the 15th of June, I left for Germany to visit and inspect the agricultural colleges and experiment stations of that country, and particularly the various patho-biological and bacteriological laboratories connected with them and with other institutions of learning. As my time was very limited, I could not visit all of them, but had to be satisfied to see those in which the investigations pursued are of the same, or of a similar, character to those which we propose to carry on at our Station, and which offered the best opportunity for becoming practically acquainted with the most recent and improved methods of the German investigators. Therefore I visited, besides the agricultural colleges and experiment stations of Poppelsdorf and Hohenheim, the patho-biological laboratories connected with the following institutions: 1, the "Thieraerztliche Hochschule" (Veterinary University), of Hannover; 2, the Veterinary Department of the University of Göttingen; 3, the Veterinary School of the University of Giessen; 4, the Royal Veterinary School of Wuerttemberg at Stuttgart; 5, the Central Veterinary School of Bavaria at Munich; 6, the Royal Veterinary School of Saxony at Dresden, and, 7, the "Thieraerztliche Hochschule" (Veterinary University) of Berlin. I also visited the celebrated laboratory of Dr. Robert Koch, Geheimer Regierungsrath and Director of the German Imperial Board of Health. I was everywhere very cordially received, and obtained in all the institutions named much valuable information.

While in Berlin, I purchased for the patho-biological laboratory of our Station such apparatus as I deemed necessary and best adapted to our purpose. All the apparatus was bought of Dr. A. Rohrbeck (firma J. F. Luhme & Co.), who has the reputation of making, at reasonable prices, the best apparatus that is made anywhere. At any rate, the apparatus made by him is used not only by Dr. Koch, but also in all the principal and best equipped laboratories of Germany. Everything I obtained is of the latest and most improved pattern. In making my selections I was assisted by an experienced bacteriologist, Medicinalrath Dr. Long, of Berlin. Owing to the yet unfinished condition of the rooms intended to be

used as a laboratory, and to the fact that no other available room could be obtained, and that I occupy a house not furnished with gas, only a part of the apparatus has as yet been used. But as the laboratory room is now about ready for occupancy, all of the apparatus will be in use in a few days.

On my return from Germany, in the middle of August, a skin disease of cattle had made its appearance in several parts of the State. It principally affected the lower extremities and appeared to be enzoötic in its character. At your request, I investigated it at two different localities, in Highland county in the southern, and in Lorain county in the northern part of Ohio, and also corresponded with parties in other sections in which the disease had made its appearance. I found that it very much resembled, so far as the morbid process is concerned, so-called "scratches" or grease-heel in horses, and that it owed its existence to causes similar, if not identical, to those which produce the last named disease. At any rate, the same remedies effective in curing scratches or grease-heel promptly produced a healing of this disease in a short time after the cause had been removed. Only one case, in which the owner of the animal had applied poultices to the sore and inflamed legs, has had a fatal termination, as far as I have been able to learn. The remedy which I prescribed is a very simple one, and composed of liquor plumbi subacetate, one part, to oleum olivarium (olive oil), three parts, to be applied liberally twice or three times a day.

Before I went to Germany you had decided that, on my return, I should take up the investigation of swine-plague, or so-called hog-cholera. This I have done. I have visited five different places in different parts of the State, where the disease happened to be prevailing, and have obtained material (morbid tissue, morbid products and blood) at four of these places, from six different animals. But as the rooms to be used as a laboratory were not ready for occupancy, and as no other room furnished with gas—the heating material required by the apparatus for making cultures—could be procured, the latter could not be used. Notwithstanding this, I succeeded in making several cultures of the swine-plague germ in nutrient gelatine, but as I had no means to keep the cultures in a suitable and uniform temperature, the growth or propagation of the germs proved to be tardy and unsatisfactory. Consequently, with reference to this part of my work I can only report progress, and have not yet been able to obtain any definite results ready for publication beyond what is already known.

While connected with the Experiment Station two years since, before its organization, I made some researches concerning the true cause or causes of certain kinds of colic in horses, with special regard to Professor

Bollinger's discovery of the exceedingly frequent occurrence of aneurysms in the anterior mesenteric artery and its branches, caused by the presence of a small worm, *Sclerostomum equinum* or *Strongylus armatus*. Prof. Bollinger, in his researches, came to the conclusion that these aneurysms, which he found in 94 per cent. of all the old horses killed for anatomical purposes in the Central Veterinary School of Bavaria, constitute the principal cause of all those cases of colic, which cannot reasonably be traced to other influences, and are known as spasmodic colic. In the winter of 1886-7 we killed six horses and mules, all old and crippled animals, for anatomical purposes at the Ohio State University, and found the aneurysm and the worms in the anterior mesenteric artery in five of them. Only one, a mule, was found to be free. This research was continued last winter, the winter of 1887-8. We killed six old horses and one colt, twenty-two months old, for anatomical purposes, and found the aneurysm in all of them, the colt not excepted. Still, as nearly all the horses were obtained through the Humane Society—only one was bought directly from the owner—the history of the same, with the exception of two of them, could not be learned. Two, it was ascertained, had repeatedly suffered from attacks of colic. We therefore resorted, towards the end of the term, to other means to ascertain the probable effect of such an aneurysm upon the circulation of the blood in the digestive organs. We injected the arteries with gypsum, and found that in at least two animals, in which the injection was successfully executed, some of the branches (intestinal arteries) of the anterior mesenteric artery had become obliterated—been closed by embolism—as Professor Bollinger stated they would be. This research will be continued this present winter, and further details will be given in a special bulletin. Therefore it may at present suffice to say, without advancing any further proof, that the evidence so far obtained seems to indicate that Professor Bollinger's views are essentially correct, and that what I said two years ago in a Bulletin of the Experiment Station has been corroborated.

Recently I had an occasion to make microscopic examinations of liver and kidney tissues of persons who had died of yellow-fever in Decatur, Alabama. These examinations have not only revealed the existence of the yellow-fever germs (short bacilli) in great numbers in the morbidly affected tissues, but have also thrown considerable light upon the morbid process. The most interesting portions of the slides examined have been photographed with a magnifying power of 760 diameters.

In addition, I may be allowed to state that photomicrographs have been made, since my return from Europe, of about twenty of the prin-

cipal pathogenic bacteria known, and that all have been photographed with the same magnifying power, namely, 760 diameters.

My work was begun so late in the season that but little of it is yet sufficiently far advanced to justify publication in detail. I will, therefore, defer such publication for the present, with the expectation of issuing one or more bulletins during the coming year, the first of which will be a monograph on the Colic of Horses.

Very respectfully submitted.

H. J. DETMERS, *Veterinarian.*

CHAS. E. THORNE, *Director Ohio Ag. Exper. Station.*

REPORT OF THE METEOROLOGIST.

LETTER OF SUBMITTAL.

SIR: I have the honor to submit herewith my report as meteorological observer for the year 1888:

As the abundance and quality of the crops harvested depend, in a great measure, upon the attendant atmospheric conditions, or, in other words, on the climate of the place, it is important to note these phenomena that we may forecast their probable influence on the crops raised in our locality.

The importance of this work was early appreciated at this Station, and soon after its establishment in 1882, the necessary instruments were procured and systematic observations on temperature and rainfall begun, a careful record of which has since been kept.

These observations are made daily, at 7 A. M., 2 P. M. and 9 P. M., local time. At these hours the following phenomena are noted:

1. Atmospheric pressure.
2. Air temperature.
3. Humidity of the air.
4. Direction and velocity of the wind.
5. Amount and kind of clouds, with the direction from which they are moving.
6. Amount and frequency of rainfall.
7. Other phenomena of interest, as the occurrence of frost, hail thunder-storms, etc.

The general meteorological conditions existing during the year will be readily understood upon an inspection of the accompanying tables, in which the results obtained are shown in detail. It has seemed to me to be well, however, to call attention to some of the leading features of the weather as shown by these data. This is done to spare the reader the infliction of a great mass of figures crowded into a table which few, probably, have the time or inclination to study.

Respectfully,

MOSES CRAIG, *Meteorologist.*

CHAS. E. THORNE, *Director.*

EXPLANATION OF TABLES.

Table I shows the daily rainfall at the Station during the year in hundredths of an inch.

T stands for "trace," an amount too small to measure.

Table II shows the daily mean temperature for the same period.

Table III contains the record of atmospheric pressure; the mean temperature; the highest and lowest temperature with the range of temperature for each month; the number of clear, fair and rainy days; with the rainfall and prevailing direction of wind for both the Experiment Station and State.

Table IV gives a comparison of the temperature and rainfall at the Station, with the six-year average for the Station and also with the normal mean of the State. These normal means are derived from observations extending over many years.

Table V shows the rainfall at the station for each month during the last six years.

Table VI contains the principal points of interest on the temperature, state of weather and rainfall during the same period.

Table VII is a summary of table VI.

METEOROLOGY.—TABLE I.—DAILY RAINFALL AT THE OHIO EXPERIMENT STATION DURING THE YEAR 1888.

Month.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
January	41				4	110	54	12	T	1		35	3		78		21
February	5	11		50	3	T		6				1		5	1		
March		23		T		8			13	32	41	T				21	
April	T	T		81					123	77	T	2			26		
May							11	194	4	1				T	3	6	1
June				10	42				168				8				4
July				101			10	66	188			20	12			16	72
August							45	19	1						35	43	
September	1	T					17								13	21	1
October	38	T			34	37	40	80	55	6	71	48	10		3	3	
November		100	22			56		24	22						T	6	
December	1	T				T							T			47	6

METEOROLOGY.—TABLE I.—Concluded.

Month.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Total for month.	Average daily rainfall.
January	2			1			1	17		20		T	2	1	4.04	0.180
February		13	5	63	T		8	75	2	1		1			1.71	0.059
March			20	T		14	13	39	47	80	44	3			4.33	0.140
April	34	3			8	3							40		2.89	0.080
May	79				T	T		42		58	61	4		T	6.67	0.275
June				T	2		3	38		46	118				2.43	0.078
July	50									T					4.72	0.182
August		T	13	198	2					T				22	5.55	0.189
September			8						11		7		T		1.25	0.042
October	103	82			36	8				8					5.14	0.166
November	38	T		T				T	8	5	7	T	T		4.30	0.145
December	3								8				14	6	1.36	0.044

METEOROLOGY.—TABLE II.—DAILY MEAN TEMPERATURE AT THE OHIO EXPERIMENT STATION DURING THE YEAR 1884.

Month.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
January.....	31.5	28.5	27.0	43.1	35.7	52.9	43.4	31.6	28.2	25.8	11.0	25.3	30.8	28.4	17.8	14.5
February.....	31.3	32.1	34.8	38.6	33.3	27.5	35.9	19.4	7.5	22.7	28.2	32.5	36.0	36.0	12.8	30.0
March.....	44.0	46.6	29.5	23.0	20.4	24.2	23.9	23.4	38.2	43.6	33.2	21.5	20.0	24.5	38.5	38.7
April.....	61.5	49.9	42.5	51.5	65.2	46.2	46.0	41.5	53.1	58.4	53.5	37.9	45.2	48.4	41.4	41.2
May.....	42.1	50.1	64.5	60.6	67.2	65.5	62.7	65.0	69.8	67.4	57.6	57.7	49.2	39.8	48.6	49.5
June.....	61.0	54.0	53.2	61.4	71.1	74.0	69.1	63.5	73.1	72.7	55.2	62.0	72.2	77.2	81.4	70.0
July.....	70.5	69.0	73.2	79.8	77.0	78.8	80.8	72.2	71.0	70.5	73.9	70.8	62.0	63.5	67.5	69.0
August.....	74.0	77.8	81.5	75.1	77.4	75.7	75.2	74.8	65.8	67.5	47.0	61.9	61.9	66.1	78.8	77.0
September.....	57.2	61.2	64.2	66.2	61.6	63.8	60.9	70.1	66.5	61.4	65.8	64.2	52.2	55.0	64.8	63.0
October.....	61.5	43.5	36.3	49.2	58.0	52.4	56.8	46.8	36.5	40.8	41.5	40.2	44.9	43.8	48.9	50.8
November.....	58.1	61.1	46.8	51.2	63.5	53.3	44.8	60.5	63.0	43.0	39.8	39.0	36.5	45.8	53.2	32.2
December.....	28.1	28.2	37.5	35.5	38.4	28.8	38.6	41.8	39.6	35.2	35.0	27.2	19.5	21.2	34.5	42.8

METEOROLOGY.—TABLE II.—Concluded.

Month.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Mean Month
January.....	26.4	11.7	15.4	18.5	9.3	16.2	24.2	20.2	29.5	14.2	6.5	2.8	35.5	37.0	34.1	24.6
February.....	38.8	38.8	48.2	43.0	32.0	33.9	39.3	44.9	36.2	21.4	9.5	22.0	37.5	50.9	50.2	31.2
March.....	34.2	35.8	56.7	54.0	33.0	12.2	23.2	24.2	34.2	55.2	41.9	37.1	41.2	59.4	59.4	36.1
April.....	51.5	46.5	43.5	45.0	45.0	45.8	43.5	38.9	46.0	58.0	60.2	65.0	67.5	69.4	64.2	46.8
May.....	54.8	60.8	48.7	53.2	61.1	64.2	64.1	62.5	63.7	67.1	67.0	74.5	66.5	68.4	64.2	60.1
June.....	81.2	82.2	78.5	84.1	80.7	80.4	80.5	76.0	72.8	73.2	69.8	71.2	63.2	68.2	79.5	60.1
July.....	74.8	72.0	70.0	66.2	69.2	76.5	72.8	73.2	71.5	77.2	78.5	71.8	73.5	76.8	79.5	72.8
August.....	76.4	70.5	69.1	67.4	66.6	58.4	61.2	63.8	66.5	76.1	68.5	59.8	61.5	67.8	69.0	70.0
September.....	58.2	59.2	64.2	62.2	57.2	59.0	59.9	58.5	58.5	61.0	52.8	40.4	38.2	49.5	56.8	56.7
October.....	43.5	43.9	49.8	39.6	39.8	43.5	43.5	47.0	53.2	55.3	57.9	43.2	49.8	48.2	56.8	47.4
November.....	32.5	39.8	40.0	33.8	31.0	31.6	29.8	34.0	35.5	31.8	33.5	35.1	37.2	36.2	35.1	42.6
December.....	34.8	25.1	20.8	23.8	21.8	23.5	38.5	43.0	47.2	51.0	30.5	30.2	29.8	34.8	36.5	33.0

METEOROLOGY.—TABLE III.—SUMMARY BY MONTHS FOR THE YEAR 1888

Month.	Barometer.					Mean Relative Humidity.	Temperature.			
	Mean.	Highest.	Date.	Lowest.	Date.		Range.	Mean.	High- est.	Low- est.
AT THE EXPERIMENT STATION.										
January.....	30.238	30.909	16th.	29.568	1st.	1.346	87.2	24.6	59.0	6th.
February.....	30.093	30.799	15th.	29.392	25th.	1.407	84.6	31.2	58.0	23d.
March.....	30.126	30.515	9th.	29.516	20th.	0.999	78.8	35.1	70.0	19th.
April.....	30.145	30.560	25th.	29.557	1st.	1.003	73.7	46.3	84.7	28th.
May.....	29.940	30.304	20th.	29.593	28th.	0.711	79.2	60.1	81.0	11th.
June.....	29.998	30.193	6th.	29.698	10th.	0.500	81.1	71.1	98.0	20th.
July.....	29.999	30.162	21st.	29.724	12th.	0.438	84.9	72.8	91.0	7th.
August.....	30.026	30.305	23d.	29.575	21st.	0.730	82.3	70.9	96.0	3d.
September.....	30.065	30.394	29th.	29.822	26th.	0.482	81.5	59.7	82.5	4th.
October.....	29.995	30.357	21st.	29.420	1st.	0.980	82.7	47.4	78.0	1st.
November.....	30.146	30.547	20th.	29.687	9th.	0.910	81.8	42.6	72.0	19th.
December.....	30.146	30.588	22nd.	29.596	17th.	0.992	83.9	33.0	58.0	26th.
Average.....	30.071	30.900	Jan. 16th.	29.392	Feb. 25th.	1.517	82.8	49.6	98.0	Jun. 20th.
FOR THE STATE.										
January.....	30.242	30.993	16th.	29.423	1st.	1.570	82.8	24.2	67.5	6th.
February.....	30.095	30.821	15th.	29.220	25th.	1.701	81.0	30.5	68.5	18th.
March.....	30.130	30.590	9th.	29.324	21st.	1.266	77.5	34.2	77.0	20th.
April.....	30.135	30.615	25th.	29.477	1st.	1.138	68.3	49.2	92.0	29th.
May.....	29.963	30.365	6th.	29.582	28th.	0.883	74.0	59.1	91.0	6
June.....	29.963	30.298	7th.	29.694	10th.	0.674	74.8	70.4	102.0	8d.
July.....	30.027	30.210	21st.	29.696	12th.	0.664	77.3	72.1	97.0	7th.
August.....	30.028	30.366	23d.	29.423	21st.	0.943	79.4	70.4	102.0	3d.
September.....	30.068	30.400	6th.	29.614	26th.	0.786	78.4	60.3	91.7	11th.
October.....	30.009	30.429	21st.	29.360	1st.	1.079	80.9	47.9	80.0	1st.
November.....	30.150	30.698	20th.	29.568	10th.	1.070	81.3	42.9	80.5	6th.
December.....	30.140	30.647	23d.	29.499	17th.	1.148	81.4	33.3	62.5	26th.
Average.....	30.080	30.993	Jan. 16th.	29.220	Feb. 25th.	1.778	78.2	49.5	102.0	7

TABLE III—Concluded.

Month.	Temperature.						No. of days.				Monthly Rainfall.	Average Daily Rainfall.	Prevailing wind.
	Date.	Monthly Range.	Mean Daily Range.	Greatest Daily Range.	Date.	Least Daily Range.	Clear.	Fair.	Cloudy.	Rain Fell.			
AT THE EXPERIMENT STATION.													
January	28th.	70.9	17.1	32.0	29th.	5.5	4	10	17	17	4.04	0.180	N. W.
February	9th.	54.0	18.7	34.5	16th.	7.5	7	10	12	13	1.71	0.059	S. W.
March	22d.	60.0	19.5	37.0	19th.	9.5	4	12	15	14	4.83	0.140	N. W.
April	25th.	61.4	25.9	43.2	28th.	14.0	16	8	6	11	2.39	0.080	N. W.
May	17th.	47.0	21.9	35.5	3d.	10.5	6	14	11	12	6.67	0.215	S. W.
June	12th.	60.5	25.5	41.0	5th.	10.5	9	15	6	8	2.48	0.078	S. W.
July	14th.	42.0	25.4	36.0	4th.	12.0	11	18	5	9	4.72	0.152	N. E.
August	23d.	58.5	22.3	34.5	30th.	4.0	11	15	9	10	5.85	0.189	S. W.
September	30th.	56.5	23.3	37.5	14th.	7.0	11	15	4	8	1.26	0.042	S. W.
October	10th.	53.0	18.8	37.5	31st.	6.0	7	9	15	15	5.14	0.166	S. W.
November	24th.	53.0	17.8	34.0	13th.	5.0	9	6	15	15	4.30	0.143	S. W.
December	22d.	49.0	17.2	34.0	23d.	5.5	4	13	14	10	1.38	0.044	S. W.
Average	Jan. 28th.	109.0	21.1	43.2	Apr. 28th.	4.0	96	141	129	142	44.20	0.120	S. W.
FOR THE STATE.													
January	27th.	82.5	16.5	39.1	12th.	1.2	48	8.8	17.4	13.6	3.65	0.118	W.
February	10th.	78.3	20.5	40.0	14th.	3.0	77	9.2	12.1	8.6	1.74	0.080	S. W.
March	23d.	83.2	19.0	45.0	19th.	2.0	60	10.8	14.2	12.4	3.56	0.115	N. W.
April	12th.	73.0	24.0	49.0	28th.	5.6	18.8	9.3	6.9	7.7	1.99	0.083	N. W.
May	3d.	67.7	21.8	50.0	2d.	2.8	63	14.2	10.2	11.4	3.77	0.122	N. W.
June	3d-4th.	68.0	23.3	50.0	18th.	2.5	11.3	12.1	6.6	9.0	3.41	0.114	S. W.
July	18th.	56.0	22.6	41.0	30th.	5.0	14.1	11.5	5.4	8.0	4.40	0.142	N. E.
August	23d.	67.0	21.1	42.6	29th.	3.0	11.5	12.0	7.5	10.4	5.16	0.108	S. W.
September	30th.	66.7	20.5	46.1	14th.	4.0	11.2	13.0	5.8	14.5	2.27	0.076	N. E.
October	6	58.0	17.1	46.0	31st.	3.0	7.0	8.1	15.9	14.5	3.98	0.127	W.
November	21st.	68.2	16.3	42.0	13th.	2.0	8.1	5.8	16.1	12.8	4.25	0.142	S. W.
December	22d.	61.5	15.1	38.0	25th.	2.6	6.6	8.6	15.3	9.1	1.47	0.047	S. W.
Average	Jan. 27th.	117.0	19.6	50.0	6	1.2	108.7	123.4	138.9	124.7	39.64	0.108	S. W.

1st and 2d. *9th, 12th and 19th. *1st, 4th and 20th. *25th and 28th. *3d and 11th. *18th and 20th. † June 18th and 20th, Aug. 3d. * May 2d and June 18th.

METEOROLOGY.—TABLE IV.—COMPARISON OF MEAN TEMPERATURE AND RAINFALL FOR THE YEAR 1888.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.	Degrees.
Mean temperature for the State.....	24.3	30.5	34.2	49.2	59.1	70.4	72.1	70.4	60.3	47.9	42.9	33.3	49.5
Mean temperature at the Station	24.6	31.2	35.1	46.3	60.1	71.1	72.8	70.9	59.7	47.4	42.6	33.0	49.6
Six-year average for Station.....	22.5	28.8	34.9	48.9	61.6	69.2	78.3	70.0	63.7	48.6	39.5	29.7	49.2
Normal mean for State.....	28.9	32.3	38.2	50.5	60.7	70.4	74.5	72.2	65.4	52.3	41.6	32.0	51.4
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Mean rainfall for State	3.65	1.74	3.55	1.99	3.77	3.41	4.40	5.16	2.27	3.98	4.25	1.47	39.64
Rainfall at the Station.....	4.04	1.71	4.33	2.39	6.67	2.43	4.72	5.85	1.26	5.14	4.30	1.36	44.20
Six-year average for Station	3.44	4.08	2.99	3.16	5.66	3.46	2.91	2.96	2.59	2.61	3.20	2.55	39.59
Normal mean for State	2.65	2.51	3.37	3.49	3.85	4.02	3.90	3.76	3.63	2.73	3.26	3.24	40.41

METEOROLOGY.—TABLE V.—MONTHLY RAINFALL AT THE EXPERIMENT STATION FOR SIX YEARS.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
1883	2.90	5.81	2.87	2.98	5.76	4.70	2.92	2.12	3.13	4.34	3.87	4.97	46.37
1884	2.77	5.29	4.10	2.40	4.34	1.11	2.23	0.45	4.23	1.49	1.13	3.87	33.41
1885	4.08	3.17	0.98	4.51	5.92	4.34	3.01	5.50	2.00	3.12	2.89	1.63	41.65
1886	4.49	1.67	2.33	3.25	6.91	2.23	3.01	1.42	3.42	1.19	4.18	3.41	38.01
1887	1.54	6.85	2.84	4.45	4.36	5.47	1.56	2.47	1.82	0.38	2.64	2.04	36.62
1888	4.04	1.71	4.33	2.39	6.67	2.43	4.72	5.85	1.36	5.14	4.30	1.36	44.20
Average	3.29	4.08	2.99	3.33	5.66	3.46	2.91	2.97	2.94	2.91	3.14	2.39	38.38

METEOLOGY.—TABLE VI.—SUMMARIES OF TEMPERATURE AND RAINFALL FOR SIX YEARS.

	1883.	1884.	1885.	1886.	1887.	1888.
<i>At the Experiment Station.</i>						
Mean relative humidity.....	82.3 per cent.	82.3 per cent.	84.2 per cent.	82.7 per cent.	79.2 per cent.	82.8 per cent.
Mean temperature.....	49° 51'	50° 01'	47° 54'	49° 52'	50° 08'	49° 56'
Highest temperature.....	97° 00 August 22	97° 00 August 20	101° 00 July 21	97° 55 June 4	102° 55 July 17	98° 50 June 20
Lowest temperature.....	7° 50 January 12	82° 00 January 25	20° 00 Feb. 21	12° 50 Feb. 17	10° 00 Jan. 11	11° 50 Jan. 28
Range of temperature.....	104° 54	129° 00	121° 00	109° 55	112° 05	109° 50
Mean daily range of temperature.....	22° 50	24° 08	28° 51	28° 56	24° 01	21° 51
Greatest daily range of temperature.....	45° 50 September 11	49° 55 July 22	58° 50 Feb. 2	48° 50 Feb. 17	47° 55 Sept. 5	43° 52 April 28
Least daily range of temperature.....	1° 58 January 28	4° 00 February 25	4° 00 Dec. 10	5° 50 Feb. 7	3° 00 Dec. 12	4° 51 August 21
Number of clear days.....	105	103	83	107	98	96
Number of fair days.....	147	119	137	145	130	141
Number of cloudy days.....	113	144	148	113	137	129
Number of days on which rain fell.....	165	149	168	154	158	142
Total rainfall.....	46.37 inches	33.40 inches	41.65 inches	38.01 inches	38.62 inches	44.30 inches.
Mean daily rainfall.....	0.127 inch	0.091 inch	0.114 inch	0.104 inch	0.100 inch	0.120 inch.
Greatest monthly rainfall.....	3.81 inches Feb.	5.29 in.-Dec. Feb.	5.32 inches May	6.91 inches May	6.85 inches Feb.	6.57 inches, May.
Least monthly rainfall.....	2.12 inches Aug.	0.46 inch August	0.38 inch March	1.19 inches Oct.	0.38 inch Oct.	1.26 inches Sept.
Warmest day of year.....	82° 7 July 23	80° 5 July 31	85° 8 July 31	81° 9 July 25	87° 0 July 17	84° 1 June 20
Coldest day of year.....	1° 0 January 22	16° 8 February 6	4° 0 Feb. 10	3° 06 Jan. 10	0° 6 Jan. 10	7° 5 Feb. 9
Prevailing direction of wind.....	N. W.	S. W.	S. W.	S. W.	S. W.	S. W.
<i>For the State.</i>						
Mean relative humidity.....	76.3 per cent.	76.8 per cent.	77.5 per cent.	77.8 per cent.	75.8 per cent.	78.2 per cent.
Mean temperature.....	49° 54	50° 06	48° 50	49° 56	51° 04	49° 55
Highest temperature.....	98° 00 August 22	99° 00 Sept. 28 and Oct. 1	101° 00 July 21	98° 56 July 7	108° 00 July 18	102° 00
Lowest temperature.....	17° 52 January 22	34° 00 Jan. 25	31° 00 Jan. 29	21° 55 Jan. 12	21° 50 Jan. 7	15° 50 Jan. 27.
Range of temperature.....	115° 55	133° 00	132° 00	120° 51	129° 00	117° 00
Mean daily range of temperature.....	19° 58	20° 04	20° 04	20° 02	21° 02	19° 56
Greatest daily range of temperature.....	55° 52 March 18	50° 00 Sept. 5 and Dec. 4	58° 55 Jan. 30	57° 50 Dec. 11	57° 00 April 11	50° 00
Least daily range of temperature.....	0° 55 December 23	1° 51 Feb. 6	1° 00 April 18 and Dec. 31	1° 51 March 27	1° 00 Jan. 15 and April 16	1° 52 Jan. 16.
Number of clear days.....	98.2	116.7	105.5	118.4	113.8	108.7
Number of fair days.....	135.4	118.3	132.8	125.7	127.3	123.4
Number of cloudy days.....	130.4	131.1	128.2	121.0	123.9	133.9
Number of days rain fell.....	146.0	145.0	147.7	130.7	120.9	124.7
Mean yearly rainfall.....	44.98 inches	40.19 inches	38.08 inches	36.71 inches	33.63 inches	39.64 inches.
Mean daily rainfall.....	0.123 inch	0.110 inch	0.104 inch	0.100 inch	0.092 inch	0.108 inch.
Prevailing direction of wind.....	S. W.	S. W.	S. W.	S. W.	S. W.	S. W.

METEOROLOGY.—TABLE VII.—GRAND SUMMARY OF TEMPERATURE AND RAINFALL FOR SIX YEARS.

At the Experiment Station.

Mean relative humidity, 82.2 per cent.
 Mean temperature, 49.°3.
 Highest temperature, 102.°5, July 17th, 1887.
 Lowest temperature, —32°, January 25th, 1884.
 Range of temperature, 134.°5.
 Mean daily range of temperature, 23.°2.
 Greatest daily range of temperature, 55.°0, February 2d, 1885.
 Least daily range of temperature, 1.°8, January 28th, 1883.
 Average number of clear days, 98.6.
 Average number of fair days, 136.5.
 Average number of cloudy days, 130.1.
 Average number of days on which rain fell, 155.
 Average yearly rainfall, 40.0; inches.
 Mean daily rainfall, 0.106 inch.
 Greatest monthly rainfall, 6.91 inches, May, 1886.
 Least monthly rainfall, 0.38 inch., October, 1887.
 Warmest day, 85.°8, July 31st, 1885.
 Coldest day, —16.°8, February 6th, 1884.
 Prevailing direction of wind, S. W.

For the State.

Mean relative humidity, 77.1 per cent.
 Mean temperature, 49.°7.
 Highest temperature, 106.°0, July 18th, 1887.
 Lowest temperature, —34.°0, January 25th, 1884.
 Range of temperature, 142.°0.
 Mean daily range of temperature, 20.°3.
 Greatest daily range of temperature, 58.°5, January 30th, 1885.
 Least daily range of temperature, 0.°5, December 23d, 1883.
 Average number of clear days, 109.8.
 Average number of fair days, 127.1.
 Average number of cloudy days, 128.1.
 Average number of days rain fell, 135.8.
 Mean yearly rainfall, 38.87 inches.
 Mean daily rainfall, 0.106 inches.
 Prevailing direction of wind, S. W.

NOTES UPON THE WEATHER OF THE YEAR.

THE WEATHER AT THE STATION—SUMMARY BY MONTHS.

January Weather.

Cloudy weather prevailed during the month; rain fell on 17 days and snow on 14, the total amount of rain and melted snow being 4.04 inches, or half an inch above the average. The heaviest showers were 1.10 inches on the 6th, 0.54 inch on the 7th, and 0.78 inch on the 15th. There were four inches of snow on the ground at the beginning of the month, and 9.3 inches fell during the month, two inches of which fell on the 27th, and one inch each on the 3d, 10th, 21st and 25th. Although so much snow fell, yet the ground was bare most of the month on account of the heavy rains. On the 15th rain and sleet covered the ground with a coating of ice, which remained for several days.

The highest barometer, 30.909 inches on the 16th, is not only the greatest atmospheric pressure for the month and year, but also the greatest since the Station was established. The lowest barometer was 29.563 inches on the 1st, making a range of 1.346 inches for the month, which is our greatest January record. The mean barometer, 30.238 inches, was also above the average.

The maximum temperature, 59°, occurred on the 6th, and the minimum, 11° below zero on the 28th, thus giving a range of 70°.

The mean temperature, 24.°6, is 2° above the average, but 4.°3 below the normal. The mean relative humidity, 87.2 per cent., is our lowest for this season of the year.

Lunar halos were noticed on the 24th and 27th. Sleet fell on the 15th and 17th. Frosts occurred on the following dates: 10th, 12th, 14th, 16th, 22nd, 24th, 26th, and 28th.

February Weather.

The highest barometer, 30.799 inches on the 15th, is the highest recorded for the month, being 0.113 inch above the average. This has been exceeded but twice in the last six years.

The lowest barometer, 29.392 inches on the 25th, was the lowest for the year. The monthly range was 1.407 inches, which was exceeded in December, 1885, when it was 0.147 inch greater.

The mean atmospheric pressure, 30.093 inches, was a little less than usual.

The maximum temperature was 58° on the 23d, and the minimum 4° on the 9th, giving a range of 54° for the month, which is unusually

small. The mean temperature, $31^{\circ}.2$, was 1° below the normal and the air was drier than usual, the humidity being 4 per cent. below the average.

Cloudy and fair weather was in excess, rain falling on 13 days. The rainfall for the month, 1.71 inches, is 2.37 inches below the average. Half an inch fell on the 4th. There was a thunder-storm on the 25th, accompanied by a fall of 0.75 inch of rain and a little hail. The snowfall was only 0.3 inch, although snow fell on six days; hail fell on the 29th. There were frosts on the following dates: 3d, 6th, 7th, 13th to 16th, 19th, 21st to 24th, and 28th.

March Weather.

The highest barometer, 30.515 inches, was considerably above the average. The lowest was 29.516 inches, thus giving a range of one inch, which is greater than usual.

The mean atmospheric pressure, 30.126 inches, was 0.078 inch above the average.

The maximum temperature, 70° on the 19th, was exceeded in 1886, when it was 5° higher. The minimum was 10° on the 22nd, giving a range of 60° for the month. The mean daily range, $19^{\circ}.5$, was about the average. The mean temperature, $35^{\circ}.1$, was above the average, while the humidity, 78.8 per cent., was considerably below.

Fair and cloudy days were about equally divided.

The rainfall, 4.33 inches, was 1.34 inches above the average, and of this 3.20 inches fell between the 20th and 28th, the heaviest showers being 0.80 inch on the 27th, and 0.63 inch on the 21st. Snow fell on eight days. At 9.15 P. M. of the 11th, with clouds $\frac{3}{4}$ stratus lying low along the horizon, there was a slight fall of snow coming apparently from the clear sky overhead. A lunar halo was seen on the 21st and a solar halo on the 29th. There was a fog on the 1st. A light thunder-storm occurred on the 20th. There were frosts on the 7th, 8th, 9th, 11th, 15th, 18th, 19th, 22nd and 23d.

April Weather.

The highest barometer, 30.560 inches on the 25th, is the highest April record. The mean barometer, 30.145 inches, is also the highest for the month, and the one-inch range is unusual. There was less moisture in the air during the month than usual. The maximum temperature was $48^{\circ}.7$ on the 28th, and the minimum, $23^{\circ}.3$ on the 25th, which is the highest April minimum. The mean temperature, $46^{\circ}.3$, is the lowest for the month, being $2^{\circ}.6$ below the average. The monthly range, 61° , is less than usual. The least daily range, 14° , was the greatest for April. The

percentage of clear and fair weather during the month was larger than usual. The monthly rainfall, 2.39 inches, is our least April record, being 0.77 inch below the average. The heaviest showers were 0.77 inch on the 10th, and 0.40 inch on the 30th. Snow fell the 15th and 20th. On the former date one-third of an inch fell, but this was melted off by the rain that fell soon after. The highest winds were 49 miles an hour, from the S. W., on the 5th, when the wind traveled 620 miles during the day, and 42 miles an hour, from the S. W., on the 30th. There was a fine aurora borealis on the 2d. A lunar halo was seen the 18th. The dews of the 27th, 28th and 29th were unusually heavy. Thin ice was formed on the 20th. There were thunder-storms on the 1st, 2d, 5th, 16th, 17th, 18th and 30th. Frosts occurred on the following dates: 3d, 4th, 7th, 8th, 11th, 13th, 17th, 20th, 21st, 24th to 26th.

May Weather.

This was the wet month of the year, the precipitation, 6.67 inches, being an inch above the average and nearly three inches above the normal. This was exceeded in 1886, when a quarter-inch more fell, making our highest record. The month was characterized by the very heavy rains, although it rained on 12 days, yet 5.44 inches fell in four showers as follows: 3.23 inches on the 8th and 9th, 0.81 inch on the 4th, 0.79 inch on the 18th, and 0.61 inch on the 28th. From 7 A. M. of the 8th to 7 A. M. of the 9th, 2.64 inches of water fell, and from 9 P. M. of the 8th to 7 A. M. of the 9th, 1.29 inches fell. On the 8th there was a terrific thunder-storm, accompanied by a heavy rain, which caused much damage on account of the high water produced. The crops in the lower part of the Station garden were entirely destroyed by the brook overflowing its banks and plowing great gullies through the field. The rain of the 8th came down as if it were poured from a bucket, but was quite local in its nature, as is shown by the fact that at the U. S. Signal Station, three miles south, only 1.17 inches fell on these two days, and at Westerville, about twelve miles north, there was only 1.50 inches.

On the 27th there was a thunder-storm lasting 95 minutes, during which 0.55 inch of rain fell. Thunder-storms also occurred on the 8th, 9th, and 28th. From noon of the 27th to noon of the 28th, 1.01 inches of water fell. The highest and mean barometer were both lower than usual. The humidity was about the average. The mean temperature, 60.°1, is 1.°5 lower than usual. The maximum temperature, 81° on the 11th, is 5° below that of any other May. The minimum was 34° on the 17th, giving a range of 47°, which is the lowest May range.

Two-thirds of the weather was clear or fair. The average daily rainfall was 0.215 inch. This excess of moisture accounts for the late frosts in the spring, which continued up to the 20th, doing immense damage to fruit-growers and gardeners. There were frosts on the 15th, 17th and 20th. Ice was seen on the 17th and was reported on the 20th. A little hail fell on the 8th. There were fine rainbows on the 8th, 9th and 22d, and a solar halo was seen on the 17th.

June Weather.

The precipitation, 2.43 inches, is more than an inch below the average, and less than half what it was last year. The rainfall was very unequally distributed, only .05 inch falling before the 22d, when heavy rains set in. From the 22d to the 25th, .74 inch fell, and from 7 A. M. of the 27th to 7 A. M. of the 28th, 1.60 inches of rain fell.

There were no thunder-storms during the month, and the general character of the weather was fair. The maximum temperature, 98° on the 20th, is our highest for June, and the minimum, 37.°5 on the 12th, is the lowest. The monthly range, 60.°5, is the greatest for the month, and the mean temperature, 71.°1, is nearly 2° above the average. The greatest daily range, 41° on the 5th, is unusually high.

The highest barometer, 30.193 inches on the 5th, is the lowest maximum for June. The mean barometer, 29.938 inches, was .040 inch below the average, while the minimum barometer was much higher than usual.

July Weather.

The maximum temperature, 91° on the 7th, is our lowest record for July. The minimum temperature was 49° on the 14th, giving a range of 42°, which is the lowest July record. The mean barometer, 29.999 inches, is the highest since 1883, as is also the maximum barometer, 30.162 inches on the 21st.

Rain fell on nine days, although there were but five cloudy days in the month. All the rain, 4.72 inches, fell between the 4th and 18th; this is our greatest July record, being 1.81 inches above the average. At the U. S. Signal Station, three miles south, it was 5.81 inches, where, for the thirty-one hours ending at 8 P. M. of the 9th, the rainfall was 3.65 inches. This remarkable record has been equaled but once within the last ten years, and that was on July 30th, 1886, when 2.84 inches fell in less than an hour. The rainfall at this Station, though not so heavy, was unusually great, being 3.36 inches for the thirty-two hours ending at 9 P. M. of the 9th. On the 8th it began to rain at 12:45 P. M.; at 2 P. M. there was .71 inch in the gauge; between 2 and 3 there was a heavy shower, .82 inch

falling in less than an hour; this was accompanied by a thunder-storm and gale from the N. W., 48 miles an hour. There were thunder-storms on the 4th, 5th, 7th, 8th and 17th, and gales on the 8th, 12th and 17th.

August Weather.

The barometer was slightly above the average; the maximum, 30.305 inches on the 23d, is the highest for August, and the minimum was 29.575 inches on the 21st, thus giving a range of .730 inch, which is the greatest for the month.

The maximum temperature was 96° on the 3d, and the minimum 41.°5 on the 23d, giving a range of 58.°5 for the month, which has been exceeded but once, namely, in August, 1887. The mean temperature, 70.°9, is 1° above the average. The greatest daily range, 34.°5 on the 30th, is the lowest for the month, as is also the least daily range, 4° on the 21st.

The rainfall, 5.85 inches, is the greatest for August, being 2.90 inches above the average. On the 4th, from 12:15 to 12:35 P. M., .33 inch of rain fell, accompanied by a heavy thunder-storm; the 7th, 8:55 to 9:15 P. M., it rained .45 inch; in this thunder-storm the lightning was very bright and the thunder terrific. The precipitation was 1.01 inches on the 4th, and 1.98 inches on the 21st. Thunder-storms occurred on the 1st, 4th, 7th, 8th, 12th, 16th and 31st. A solar halo was seen on the 14th.

September Weather.

The maximum barometer, 30.304 inches on the 29th, was much lower than usual; the minimum was 29.822 inches on the 26th, giving a range of .422 inch, the least for September, but the mean was about the average. The maximum temperature, 82.°5 on the 4th, is the lowest maximum for September; the minimum was 26° on the 30th, so that the monthly range was 56.°5.

There were four cloudy and eight rainy days in the month. The rainfall, 1.26 inches, was 1.33 inches below the average, and is the least for the month. The heaviest rainfall was .33 inch on the 16th. A little snow fell on the 30th. The dews of the 2d, 3d, 6th, 17th, 22d and 24th, were unusually heavy; there was none on the 27th. There were fogs on the 4th, 9th, 20th, 24th and 28th.

The first frost was a light one, the temperature falling to 34.°5 the night of the 13th. The first killing frost was the night of the 29th, with a temperature of 26°; other frosts occurred on the 28th and 30th.

October Weather.

The rainfall, 5.14 inches, is phenomenal, being the heaviest for the month since the Station was established, and 2.53 inches above the average. In October, 1887, only 0.38 inch fell. The greatest precipitation in twenty-four hours was an inch and a half from 7 A. M. of the 18th to 7 A. M. of the 19th, of which 1.03 inches fell on the 18th. On the 7th there was rain from a cloudless sky at 7 P. M., and again at 9:30 P. M. a very light sprinkle. There were no clouds where the rain came from, although there were a few on the western horizon.

On the afternoon of the first there was a violent gale from the west, which blew down some trees and broke off many branches from others, also a very heavy rain and some hail, accompanied by a heavy thunder-storm, which lasted about twenty-five minutes. The rain was driven in sheets before the wind, the velocity of which was 33 miles an hour, and much of the rain was blown over the gauge. The distance traveled by the wind during the day was 500 miles. Solar and lunar halos were seen the 21st. There was sleet on the 6th, a rainbow on the 19th, and a dense fog on the 23d. Thunder-storms on the 1st, 18th and 19th. Snow on the 1st, 2d, 6th, 16th, 18th, 19th and 20th. Frosts were noticed on the 3d, 9th, 10th, 20th, 21st, 24th, 25th, 30th and 31st.

November Weather.

The most noticeable features of the weather were the high mean temperature and the heavy rainfall. The precipitation, 4.30 inches, is the highest on our records for the month, being 1.10 inches above the six-year average. The heaviest showers were 1 inch, on the second, and .80 inch on the 8th; the average daily rainfall was .143 inch. Snow fell the 16th, 18th, 26th, 27th and 28th, and sleet on the 18th and 30th. The first snow of the season came on the 16th; it fell slowly and steadily for several hours, but the ground being wet it melted as it fell. The day before the snow many plants were in bloom, and the grass was green and growing nicely.

The maximum temperature, 72° on the 1st and 2d, is the highest on our records for November, giving a range of 53° for the month, which is lower than usual. Fair and cloudy days were about equally divided, and the humidity, 81.8 per cent., is unusually low. There was a gale on the 10th, during which the velocity of the wind was 36 miles an hour, from the S. W.

The mean barometer was 30.146 inches, the highest, 30.547 inches on the 20th, and the lowest, 29.637 inches on the 9th, giving the rather small range of .910 inch for the month. There was a rainbow on the 9th and a

lunar halo on the 17th. There were frosts on the 4th, 12th to 14th, 17th, 21st, 22d to 25th, and 28th.

December Weather.

This month has justified the statement that Columbus has a variable climate. There were frequent and sudden changes of temperature, one day being warm and fair and the next cold and blustering. The month came in cold, but soon the ice melted, the frost came out of the ground, and buds on some of the trees began to swell; but this did not last long, for the weather again became cold. These alternations of high and low temperature continued throughout the month, occurring every few days. The mean temperature for the month, 33° , is 3° above the average, and is our highest December mean. The maximum temperature was 58° on the 26th, and the minimum, 9° on the 22d, giving a range of 49° , which is unusually small. Clear and fair days were slightly in excess of cloudy ones, and the humidity, 83.9 per cent, is unusually low. The precipitation, 1.36 inches, is our lowest for December, being 1.19 inches below the average, and 1.88 inches below the State normal; the average daily rainfall was only 0.44 inch. The rain was well distributed through the month, the heaviest shower being .47 inch on the 16th. A little snow fell on the 1st, 13th and 18th. Sleet and snow fell during the night of the 6th, covering the ground with a thin coating of ice. On the 2d there was a peculiar dense brownish haze which concealed objects situated at a short distance from view, and on the 30th a similar haze was followed by rain. There were fogs on the 8th, 10th, 16th and 17th. Lunar halos were seen the 11th, 12th, 15th and 21st. Frosts occurred as follows: 2d, 4th, 5th, 7th, 10th, 11th, 12th, 14th, 15th, 22d, 23d, 24th and 29th.

WEATHER AT THE STATION—SUMMARY FOR THE YEAR.

The precipitation for the year, 44.20 inches, was much heavier than usual, and has been exceeded but once since the Station was established; this was in 1883, when it was 2.17 inches greater. It will be seen, on an examination of the tables, that while for the State at large there was a deficiency of an inch, there was an excess of nearly four inches at the Station; this will account, perhaps, for the cool season.

There were seven months in which the rainfall was over four inches, and three in which it exceeded five inches. The heaviest monthly rainfall, 6.67 inches, occurred in May. This record has been broken once, in May, 1886, when it was .24 inch greater. The least monthly rainfall was 1.26 inches in September, our smallest September record. The lowest point touched on the thermometer, and the heaviest snowfall, was in Jan-

uary. The lowest temperature was 11° below zero, January 28th, and the highest, 98° , June 20th, thus giving a range of 109° for the year, which is considerably less than usual. The last frost in the spring occurred May 19; this was a light one, the last killing frost being April 25, when the temperature fell to 23° ; the first in the fall occurred September 14, and was a light one, the first killing frost being September 30, with a temperature of 26° . The highest barometer, 30.909 inches, January 16, is the highest on our records; the lowest was 29.392 inches, February 25, giving a range of 1.517 inches, which was exceeded in 1886 by a range 0.092 of an inch greater.

GENERAL NOTES ON WEATHER AND CROPS AT THE STATION.

Columbus, fortunately, is free from high winds and extreme temperatures, its climate being characterized by variability rather than severity.

The year was, on the whole, a good one for crops. While there were no remarkable degrees of heat or cold recorded, each month, with a few exceptions, had a lower temperature average than usual. The exceptions were June, November and December, which had an excess of about 1° each.

While the winter was not as severe as preceding ones, yet the conditions were such that wheat was badly injured. This was probably caused more by freezing, or heaving out, than by being frozen in the soil.

There was an insufficient covering of snow during the winter, as the ground was bare during nearly all of January, February and March. Although snow fell on many days, there was but little of it, and what there was soon melted off. The drought, while strawberries were ripening, although of short duration, did considerable damage to this crop. With these exceptions, crops were more than usually abundant. There was a greater quantity of seed produced by our uncultivated trees and plants this year than usual, the seeds being large and plump.

The effect of the weather on wheat and corn will be shown in the Agriculturist's report and its influence on vegetables and fruits may be seen by examining that of the Horticulturist.

STATE WEATHER SUMMARY FOR THE YEAR.

The following summary of the weather during the year was furnished by the Secretary of the Ohio Meteorological Bureau, to whom we are also indebted for notes on the weather of the State embodied in some of the tables.

The mean atmospheric pressure was 30.080 inches, which is .022 inch above the average for the past six years. The highest barometer, 30.993

inches, occurred at Wauseon on the 16th of January. It is the highest on record, being .089 inch higher than the maximum pressure for 1887, the highest previous record. The lowest barometer, 29.220 inches, occurred at Toledo on the 25th of February.

The mean temperature, 49.°6, was about normal, being only 0.°2 below the average. The maximum temperature, 102°, occurred at Pomeroy on June 18th and 20th, and at Logan on August 3d; and the minimum temperature, 15° below zero, at New Bremen on the nights of the 27th and 28th of January. The mean temperatures of January, February, August, November and December were above the averages for those months, the greatest excess being 2.°7 in December. The means for March, April, May, June, July, September and October were below the average, the greatest deficiency being 3.°8 in October. The mean daily range of temperature, 19.°8, is slightly below the average. The greatest daily range, 50°, occurred at Pomeroy on May 20th and June 18th.

Light frost was reported on August 23d, from Sidney, Greenville, Wauseon, Paulding, Newcomerstown, Canton and Lordstown. The first killing frost was reported from Ellsworth on September 13th.

The mean relative humidity was about normal. Rain fell on 125 days, which is 11 days below the average. The yearly rainfall, 39.64 inches, is 0.77 in excess of the usual amount. The mean monthly rainfall was 3.30 inches. The average for the past six years is 3.24 inches.

REPORT OF THE BURSAR.

SIR: I herewith submit a summary statement of the financial operations of the Ohio Agricultural Experiment Station for the year ending June 30, 1888.

The appropriations made by Congress for agricultural experiment stations are made for the fiscal year ending June 30, and the stations are required to furnish annually a detailed report of the expenditure of such appropriations. This report is made in Statement A, which is a copy of the report of the Auditor and Treasurer of the Board of Control, made to the Governor of the State, as required by the so-called Hatch act.

Previous to April 1, 1888, the Station received no income from sales of produce, as all produce was turned over to the University. Since the date named, the produce of the farm and gardens has belonged to the Station, and Statement B shows the receipts and expenditures from this source for the three months ending June 30, this date being chosen as the end of the fiscal year for this fund, in order to combine the entire financial transactions of the Station in a final statement.

This combination is made in Statement C.

Respectfully,

W. S. DEVOL, *Bursar.*

CHAS. E. THORNE, *Director Ohio Agr. Ex. Station.*

STATEMENT A.

OHIO AGRICULTURAL EXPERIMENT STATION IN ACCOUNT WITH THE UNITED STATES
TREASURY.

1888.

To receipts from Treasurer of the United States, as per appropriation for year ending
June 30, 1888, under act of Congress approved March 2, 1887..... \$15,000 00

June 30. By salaries.....	\$1,887 50
" labor.....	2,077 61
" supplies.....	1,422 57
" freight and expressage.....	87 07
" postage and stationery.....	150 20
" printing.....	341 50
" library.....	214 58
" tools, implements and machinery.....	1,617 39
" scientific instruments.....	312 32
" chemical apparatus and supplies.....	.....
" furniture.....	186 00
" general fittings.....	271 68
" fencing and drainage materials.....	261 05
" live stock.....	3,025 00
" travel and expenses Board of Control.....	145 69
" incidentals.....	.....
" buildings.....	2,999 84

Total..... 15,000 00

I, the undersigned, duly appointed auditor for the corporation, do hereby certify that I have examined the books and accounts of the Ohio Agricultural Experiment Station for the fiscal year ending June 30, 1888; that I have found the same well kept and correctly classified as above, and that the receipts for the time named are shown to have been \$15,000.00, and the corresponding disbursements \$15,000.00, for all of which proper vouchers are on file, and have been by me examined and found correct.

S. H. ELLIS,

Auditor Board of Control.

I hereby certify that the foregoing statement of account, to which this is attached, is a true copy from the books of account of the institution named.

J. H. BRIGHAM,

Treasurer Board of Control.

STATEMENT B.

OHIO AGRICULTURAL EXPERIMENT STATION IN ACCOUNT WITH PRODUCE FUND.

1888.

	<i>To Receipts.</i>	<i>Dr.</i>
June 30. From sales of milk.....	\$1,063 14	
" " " " farm produce.....	260 83	
" " " " horticultural produce.....	138 23	
" " labor.....	75	
Total	\$1,462 95	

1888.	<i>By Expenditures.</i>	<i>Cr.</i>
June 30. For labor.....		\$198 34
" " supplies		2 74
" " general fittings.....		20 17
" " fencing and drainage material.....		12 00
" " buildings		64 41
Total		\$297 68
Balance carried forward.....		1,165 29
Total		\$1,462 95

STATEMENT C.

TOTAL RECEIPTS AND EXPENDITURES OF THE OHIO AGRICULTURAL EXPERIMENT STATION, FOR THE FISCAL YEAR ENDING JUNE 30, 1888.

Receipts.

From U. S. Treasury.....	\$15,000 00
From sales of produce.....	1,462 95
Total	\$16,462 95

Expenditures.

For salaries	\$1,887 50
" labor	2,275 95
" supplies.....	1,425 31
" freight and expressage.....	87 07
" postage and stationery.....	150 20
" printing.	341 50
" library.....	214 58
" tools, implements and machinery.....	1,617 39
" scientific instruments	312 32
" chemical apparatus and supplies.....	
" furniture.....	186 00
" general fittings	291 85
" fencing and drainage materials.....	273 05
" live stock.....	3,025 00
" travel and expense, Board of Control.....	145 69
" incidentals	
" buildings	3,064 25
Total	\$15,297 66
Balance carried forward.....	1,165 29
Total	\$16,462 95

APPENDIX.

HISTORY, ORGANIZATION AND WORK OF THE OHIO AGRICULTURAL EXPERIMENT STATION.

HISTORY.

The Ohio Agricultural Experiment Station was established by an act of the State legislature, passed April 17, 1882. This act was amended April 18, 1883, and March 15, 1888, the amendments having reference to the tenure of office of the Board of Control and to the salary of the Director, and not affecting the general import of the measure. In its present form it stands as follows :

AN ACT

For the establishment of an Agricultural Experiment Station.

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio, That for the benefit of the interests of practical and scientific agriculture, and for the development of the vast agricultural resources of the State, an Ohio Agricultural Experiment Station is established as hereinafter provided.*

SEC. 2. The location, control and general management of the Experiment Station shall be committed to a Board of Control, which shall consist of five members, three of whom shall be appointed by the Governor, and their term of office shall be three years, and until their successors are duly appointed and qualified. The Governor of the State and the person appointed as hereinafter provided to be Director of the Station, shall be ex-officio members of the Board of Control, and, together with those members appointed by the Governor, shall constitute the Board of Control.

SEC. 3. The Board of Control shall be called together by the Governor at as early a date as possible, and shall organize by the election of a president, secretary and treasurer, who shall hold their offices until their successors are elected. Three members shall constitute a quorum.

SEC. 4. The Board of Control shall hold an annual meeting, at the date of the annual meeting of the State Board of Agriculture, in January, and other meetings at the call of the president, at such times and places as shall best promote the object of the Station.

SEC. 5. The Board of Control shall locate said Station, and shall appoint a competent Director, who shall have the general management and oversight of the experiments and investigations necessary to carry out the objects of the Station. The said Board shall also make such rules, by-laws, and regulations for the government of the Station and its work, and in carrying out the business and purposes of the Station, as shall be necessary and proper in their judgment. It shall also make an annual report of its expendi-

tures and work to the Governor of the State, and the same shall be published annually in the Ohio Agricultural report, and five thousand copies separate in pamphlet form for free distribution, and the pamphlet copies to be printed and paid for the same as other public printing.

SEC. 6. The Director's salary shall be fixed by the Board of Control in proportion to the amount of service required and performed, and shall be paid out of the funds appropriated by Congress, in such installments as may be determined by them. The members of the Board of Control shall be paid their actual expenses while on duty, but no compensation shall be allowed them for time or services.

FIRST ORGANIZATION.

Under the provisions of this act, as originally passed, the following gentlemen were appointed members of the Board of Control, in April, 1882, by Governor Charles Foster:

Nicholas Ohmer, Dayton, representing the State Horticultural Society; W. I. Chamberlain, Columbus, representing the State Board of Agriculture, and Emmet Mix, Avenue, representing the State Grange.

These gentlemen met at Columbus, April 25, and completed the organization of the Board by the election of the proper officers and the appointment of William R. Lazenby, Professor of Horticulture in the State University, as Director.

The Trustees of the Ohio State University, at Columbus, having offered the Station the free use of so much land as might be needed for field experiments, and the use of laboratories, apparatus, etc., the Station was located at that institution.

Nathaniel W. Lord, E. M., Professor of Mining and Metallurgy at the University, was appointed Chemist to the Station; W. S. Devol, Botanist, and W. B. Alwood, Superintendent of Field Experiments. A year later W. J. Green was appointed Horticulturist.

Under this organization the Station immediately commenced its work, which has now extended over six consecutive seasons. The results of this work have regularly been presented to the farmers of the State in annual reports, as well as in occasional bulletins, which have been given a still wider circulation through the agricultural press of this and other states. The sixth annual report summarizes the principal results obtained during the entire six-year period.

CHANGES IN ORGANIZATION.

In 1884 Secretary Chamberlain was succeeded as member of the Board of Control by W. N. Cowden, of Quaker City; in 1885 Mr. Ohmer was succeeded by J. C. Stevens, of Kenton; in 1887 Mr. Cowden was succeeded by S. H. Ellis, of Springboro, and Mr. Mix, having died in office, by Hon. J. H. Brigham, of Delta.

Emmett Mix had served continuously as member of the Board of Control since the first organization of the Station, and to his intelligent and earnest sympathy with its work and faithful co-operation with its Directors and other officers, are largely due whatever success it has attained.

In 1884 Prof. Henry A. Weber was elected Professor of Agricultural Chemistry in the State University, and as Professor Lord's time was closely occupied with his professional duties, and by the analysis of fertilizers, which had been placed in his hands by the State Board of Agriculture, he was, by mutual consent, relieved from the duties of Chemist to the Station, and Professor Weber was appointed Chemist in his stead.

In 1886 the following changes were made, as announced in the report of W. N. Cowden, President of the Board of Control for that year:

At the beginning of the year William R. Lazenby, who had held the position of Director ever since the establishment of the Station, offered his resignation. This was done because the work in the department of botany and horticulture had increased to such an extent that he no longer had time to perform the duties of the position. The resignation was not accepted.

It was necessary, however, that some new arrangement be made that would insure a division of the work imposed, and after careful consideration the following agreement was mutually adopted by the Board of Control and the Trustees of the State University:

1. The Professor of Agriculture in the University is made Director, and the Professor of Horticulture Vice-Director of the Station.

2. The Station is to conduct such experiments on the University farm and in the fruit and vegetable gardens as may be mutually agreed upon by the Board of Control of said Station and said Professors of Agriculture and Horticulture. The field and feeding experiments to be conducted by the Superintendent of the University farm, under the direction of the Professor of Agriculture, and the experiments and investigations in horticulture to be conducted by the Superintendent of the gardens, under the direction of the Professor of Horticulture, the work to be done and the expense to be borne by said Station. One-half of the salary of the Superintendent of field and feeding experiments and one-third of the salary of the Superintendent of horticultural experiments to be paid by the University.

3. The Professor of Agricultural Chemistry to be Chemist, and the Professor of Veterinary Surgery to be Veterinarian to the Station, and to be paid by said Station for experimental work actually done.

4. All former agreements and resolutions by and between said Board of Control and Trustees of the University to be binding and in full force, except so much as may conflict with the above agreement, and the present agreement to be in force so long as mutually acceptable to the Board of Control and Trustees of the University.

After the adoption of this contract the Vice-director of the Station was elected Secretary of the Board of Control, and Mr. W. B. Alwood, who had resigned the position of Superintendent of Field Experiments, in order to accept an appointment as special agent in the Division of Entomology, U. S. Department of Agriculture, was appointed Entomologist to the Station, the former position being taken by Mr. W. S. Devol, who had been appointed Farm Manager.

THE NATIONAL EXPERIMENT STATION LAW.

In March, 1887, the work of agricultural experimentation in America received a new impulse from the enactment of a national law providing for the establishment of an Agricultural Experiment Station in each State and Territory, and appropriating to each State or Territory the sum of \$15,000 annually for this purpose.

The bill providing for these stations was introduced into Congress and ably and zealously championed by Hon. W. H. Hatch, of Missouri, Chairman of the House Committee on Agriculture. Its text is as follows:

THE HATCH ACT.

AN ACT to establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an act approved July second, eighteen hundred and sixty-two, and of the acts supplementary thereto.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science, there shall be established, under direction of the college or colleges, or agricultural departments of colleges, in each State or Territory established, or which may hereafter be established, in accordance with the provisions of an act approved July second, eighteen hundred and sixty-two, entitled "An act donating public lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," or any of the supplements to said act, a department to be known and designated as an "agricultural experiment station;" *provided,* that in any State or Territory in which two such colleges have been or may be so established the appropriation hereinafter made to such State or Territory shall be equally divided between such colleges, unless the legislature of such State or Territory shall otherwise direct.

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories.

SEC. 3. That in order to secure, as far as practicable, uniformity of methods and results of the work of said stations, it shall be the duty of the United States Commissioner of Agriculture to furnish forms, as far as practicable, for the tabulation of results of investigation or experiments; to indicate, from time to time, such lines of inquiry as to him shall seem most important; and, in general, to furnish such advice and assistance as will best promote the purposes of this act. It shall be the duty of each of said stations, annually, on or before the first day of February, to make to the Governor of the State or Territory in which it is located, a full and detailed report of its operations, including a statement

of receipts and expenditures, a copy of which report shall be sent to each of said stations, to the said Commissioner of Agriculture, and to the Secretary of the Treasury of the United States.

SEC. 4. That bulletins or reports of progress shall be published at said stations at least once in three months, one copy of which shall be sent to each newspaper in the States or Territories in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the station will permit. Such bulletins or reports and the annual reports of said stations shall be transmitted in the mails of the United States, free of charge for postage, under such regulations as the Postmaster-General may from time to time prescribe.

SEC. 5. That for the purpose of paying the necessary expenses of conducting investigations and experiments and printing and distributing the results as hereinbefore prescribed, the sum of fifteen thousand dollars per annum is hereby appropriated to each State, to be specially provided for by Congress in the appropriation from year to year, and to each Territory entitled under the provisions of section eight of this act, out of any money in the treasury proceeding from the sales of public lands, to be paid in equal quarterly payments, on the first day of January, April, July and October in each year, to the treasurer or other officer duly appointed by the governing boards of said colleges to receive the same, the first payment to be made on the first day of October, eighteen hundred and eighty-seven; *Provided, however,* That out of the first annual appropriation so received by any station an amount not exceeding one-fifth may be expended in the erection, enlargement, or repair of a building or buildings necessary for carrying on the work of such station; and thereafter an amount not exceeding five per centum of such annual appropriation may be so expended.

SEC. 6. That whenever it shall appear to the Secretary of the Treasury from the annual statement of receipts and expenditures of any of said stations that a portion of the preceding annual appropriation remains unexpended, such amount shall be deducted from the next succeeding annual appropriation to such station, in order that the amount of money appropriated to any station shall not exceed the amount actually and necessarily required for its maintenance and support.

SEC. 7. That nothing in this act shall be construed to impair or modify the legal relation existing between any of the said colleges and the government of the States or Territories in which they are respectively located.

SEC. 8. That in States having colleges entitled under this section to the benefits of this act and having also agricultural experiment stations established by law separate from said colleges, such States shall be authorized to apply such benefits to experiments at stations so established by such States; and in case any State shall have established under the provisions of said act of July second aforesaid, an agricultural department or experimental station, in connection with any university, college or institution not distinctively an agricultural college or school, and such State shall have established or shall hereafter establish a separate agricultural college or school, which shall have connected therewith an experimental farm or station, the legislature of such State may apply in whole or in part the appropriation by this act made, to such separate agricultural college or school, and no legislature shall by contract express or implied disable itself from so doing.

SEC. 9. That the grants of moneys authorized by this act are made subject to the legislative assent of the several States and Territories to the purpose of said grants; *Provided,* That payment of such installments of the appropriation herein made as shall become due to any State before the adjournment of the regular session of its legislature meeting next after the passage of this act, shall be made upon the assent of the Governor thereof duly certified to the Secretary of the Treasury.

SEC. 10. Nothing in this act shall be held or construed as binding the United States to continue any payments from the Treasury to any or all the States or institutions

mentioned in this act, but Congress may at any time amend, suspend, or repeal any or all the provisions of this act.

Approved, March 2, 1887.

On the sixteenth of the same month the Ohio Legislature adopted a joint resolution applying Ohio's share of the funds provided by this act to the Ohio Agricultural Experiment Station. This resolution was re-adopted in the following form February 9, 1888:

JOINT RESOLUTION

Relative to control and expenditure of funds appropriated by Congress for Agricultural Experiment Station in Ohio.

WHEREAS, The Congress of the United States of America has passed an act, approved March 2, 1887, to establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an act approved July 2, 1862, and of the acts supplementary thereto; and

WHEREAS, Said act of Congress, approved March 2, 1887, provides that in States having colleges entitled to the benefits of this act, and having also agricultural experiment stations established by law separate from said colleges, such States shall be authorized to apply such benefits to experiments at stations so established by such States; and

WHEREAS, The State of Ohio, by an act passed April 17, 1882, and by acts supplementary thereto, has established an agricultural experiment station separate from the college established in this State under the provisions of said act of Congress, approved July 2, 1862, and of the acts supplementary thereto; therefore,

Resolved by the General Assembly of the State of Ohio, That the annual appropriations provided for by said act of Congress, approved March 2, 1887, be and are hereby applied to the use of the Ohio Agricultural Experiment Station, and shall be controlled and expended by the Board of Control of said station.

ORGANIZATION UNDER THE HATCH ACT.

It was the evident intention of Congress that the act creating experiment stations, and which is generally known as the Hatch bill, should take effect, and its first appropriation become available October 1, 1887; but on account of a defect in the wording of the bill, the Comptroller of the Treasury ruled that no appropriation had been made, and it was therefore necessary to wait until this question should be definitely settled by Congress before operations under the new law could begin. On January 30, 1888, a bill was passed by both houses of Congress, making the appropriations for the fiscal year 1887 contemplated in the Hatch bill, and was promptly signed by the President.

Under the arrangement that had hitherto existed between the University and the Station the professors who had held the position of Director had been able to give the Station but a part of their time, their salaries being paid entirely by the University, and no abatement being made in their class-room work because of their connection with the Station. To conduct the enlarged work which would be expected of the

Station under the increased resources afforded by the national law, the Board of Control felt that the entire time of the Director would be required, and as Prof. Lazenby and Dr. Townshend, who had in turn acceptably filled the position of Director since the organization of the Station, were both unwilling to sever their connection with the University, C. E. Thorne, of Springfield, was appointed Director.

To Directors Lazenby and Townshend the farmers of Ohio are under lasting obligation. They were among the most active workers in procuring the legislation under which the Station was first organized, and throughout its existence they have given their time and strength to its work without compensation.

CO-OPERATION BETWEEN UNIVERSITY AND STATION.

Hitherto the Station had occupied but a small portion of the University farm. For the successful conduct of its larger work it was felt that more land would be needed, and at a conference held December 8, 1887, between the Board of the Station and the Board of Trustees of the University, the following agreement was entered into:

Articles of Agreement between the Board of Trustees of the Ohio State University and the Board of Control of the Ohio Agricultural Experiment Station.

Both boards desiring to promote the interests and efficiency of these institutions adopted these resolutions for their mutual advantage.

1. The Ohio Agricultural Experiment Station will be permitted to use the following real estate: All lands west of Neil avenue extending to the north line of the University premises, except the two dormitories and the field adjacent on the north used as a play ground, and such portion of the pasture field adjoining as may hereafter be designated by the trustees. Also the sixteen acre field north of the college and east of Neil avenue, extending to the wood lot on the east, the said wood lot to remain with the University.

2. The University shall reserve such live stock, implements and personality as it shall need for its own use; the Station shall take such as it needs as a fair appraisement and pay for it when able, and the balance may be sold by the University.

3. The professors of the several technical departments shall have an opportunity to carry on original investigation and research and to instruct their classes in their respective lines of work on said lands whenever practicable.

4. The Station will employ student labor as far as practicable.

5. If questions arise between the University and the Station they shall be settled by arbitration, one arbitrator to be appointed by the University and one by the Station, and if they differ the two shall choose a third.

Under this agreement the entire cultivated portion of the University farm is transferred to the control of the Station. On February 20, a joint committee of the two boards appraised the teams, live-stock and implements belonging to the University, and the entire outfit was taken by the Station at the appraisement, with a few exceptions.

COMPLETION OF NEW ORGANIZATION.

On Monday, April 2, the formal transfer of the Station, from its old management, under the State law alone, to its new work under the combined State and national laws took place, its recently elected officers beginning their work on that date.

WHAT THE STATION PROPOSES TO DO.

The following announcement, which has appeared annually in the reports of the Station, is a concise statement of the character of its work:

GENERAL ANNOUNCEMENT.

The Ohio Agricultural Experiment Station was established in accordance with an act of the General Assembly, approved April 17, 1882, "for the benefit of the interests of Practical and Scientific Agriculture, and for the development of the vast Agricultural resources of the State."

The experiments and investigations are carried on both in the field and laboratory, and deal with the following great agricultural interests, viz.: (1) Grain Raising. (2) Stock Farming and Dairy Husbandry. (3) Fruit and vegetable Culture. (4) Forestry.

The Station is prepared to test varieties; to examine seeds that are suspected of being unsound or adulterated; to identify and name weeds and other plants; to investigate and describe, when known, the habits of injurious and beneficial insects, and other work of a similar character that properly comes within its province.

It is the desire of the Board of Control to make the station as widely useful as its limited appropriation will permit. To this end we earnestly invite the co-operation of the people and press of the State.

All communications on agricultural and horticultural topics will be fairly considered, and, as far as possible, promptly answered. Detailed reports of experiments, carefully and conscientiously made, will aid the Station in its work. Any citizen of Ohio, who is concerned in the promotion of agriculture, has a right to apply to the Station for any information it can render, and the Station will cheerfully respond to all applications, as far as lies in its power.

Samples of different varieties of corn, wheat, oats, barley and other grains; the seeds of fruit and forest trees; vegetables and flowers, that are true to name; specimens of grasses, weeds, and other plants that may be of interest; sections of different varieties of wood; specimens of injurious and beneficial insects; these, and other articles and materials illustrative of any department of agriculture, will be gladly received.

Address all communications to

EXPERIMENT STATION, Columbus, Ohio.

The foregoing statement will serve as well to outline the proposed future work of the Station as it has for that of the past. It is not proposed to deviate, in any important point, from the policy which has guided the management of the Station hitherto; such departures as may be made will be generally in the direction of extending and elaborating the lines of work already undertaken.

To go a little more fully into details, the questions requiring investigation by the Ohio Agricultural Experiment Station may be divided into three principal groups, according as they are related to the soil, to the growth of crops and vegetation, or to domestic animals and their products.

I. The soil will be studied—

(1) In its varieties, as found in different parts of the farm, and of the State.

(2) In its physical properties, as affected by tillage, drainage, irrigation, etc.

(3) In its chemical properties, as related to the maintainance of fertility by the use of fertilizers and otherwise.

II. In vegetation and crop production some of the objects of study will be—

(1) Varieties, including the selection and dissemination of new sorts; the establishment of synonyms; the comparisons of strains of varieties; the production of improved varieties, etc., etc.

(2) Methods of culture, embracing quantity of seed; methods of planting; after culture; methods of harvesting; effects of fertilizers and soils upon quality of produce, etc., etc.

(3) Vegetable pathology, including studies of rusts, smuts, blights, rots, mildews, etc.

(4) Control of injurious insects.

(5) Forestry, embracing the culture of forest trees for windbreaks, for timber, for nuts and incidental products.

III. In the study of animals some of the problems will be—

(1) Breeds, and their comparative values for different purposes.

(2) Foods and feeding, for growth; for meat; for milk and wool.

(3) The diseases of animals, especially those of contagious, epizootic or parasitic nature.

In the execution of this work the studies of the soil and of vegetation will be conducted along parallel lines in agriculture and horticulture, the experiments being so planned, as far as possible, as to elucidate problems in both these lines of work, the agricultural and horticultural departments of the Station being each equipped with an independent outfit of teams, implements, employees, etc.

In the conduct of this work, the Director will have the co-operation of the following specialists:

A *Horticulturist*, who will superintend experiments upon fruits and garden vegetables.

An *Agriculturist*, who will conduct field and feeding experiments.

An *Entomologist* and *Botanist*, who will conduct experiments on the control of injurious insects and the diseases of plants.

A *Veterinarian*, who will study the diseases of farm animals, visiting various parts of the State in this work when necessary. *It is not intended that the Station shall enter into competition with the veterinary profession, or become a free dispensary for the treatment of all animal complaints; therefore it will not undertake to treat sick animals, except in case of outbreaks of contagious, parasitic or epizootic diseases.* The agricultural press of the State is prepared to give free and trustworthy advice concerning the diagnosis and treatment of all ordinary animal ailments, and hence it would be a waste of the Station's resources for it to undertake this work.

A *Chemist*, who will conduct investigations upon the chemistry of plants and animals; studying the effect of fertilizers upon quality of crops; the digestibility of foods of animals, and many similar questions.

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TWENTY-SECOND ANNUAL REPORT
OF THE
OHIO STATE
HORTICULTURAL SOCIETY.

FOR THE YEAR 1888-9.

ORGANIZED IN 1847 AS OHIO POMOLOGICAL SOCIETY.

17 A. Appendix.

OFFICERS OF THE SOCIETY FOR 1889.

*HOSMER G. TRYON, Willoughby.....	<i>President.</i>
GEORGE W. CAMPBELL, Delaware.....	<i>Vice-President.</i>
W. W. FARNSWORTH, Waterville.....	<i>Secretary.</i>
N. H. ALBAUGH, Tadmor.....	<i>Treasurer.</i>

AD INTERIM COMMITTEE, WITH ABOVE OFFICERS.

GEO. M. HIGH.....	Middle Bass, Ottawa Co.
MATTHEW CRAWFORD	Cuyahoga Falls, Summit Co.
F. R. PALMER.....	Mansfield, Richland Co.
THEO. F. LONGENECKER.....	Dayton, Montgomery Co.
JAS. EDGERTON.....	Barnesville, Belmont Co.
O. W. ALDRICH.....	Columbus, Franklin Co.
HENRY YOUNG.....	Ada, Hardin Co.
NELSON COX.....	Bradrick, Lawrence Co.
S. H. HURST	Chillicothe, Ross Co.
S. R. MOORE	Zanesville, Muskingum Co.

STANDING COMMITTEES.

ON NOMENCLATURE.

LEO WELTZ.....	Wilmington, Clinton Co.
J. B. HURST	Chillicothe, Ross Co.
*H. G. TRYON.....	Willoughby, Lake Co.
GEORGE W. CAMPBELL	Delaware, Delaware Co.
N. OHMER.....	Dayton, Montgomery Co.
DANIEL DUER.....	Millersburg, Holmes Co.

ON FORESTRY.

LEO WELTZ.....	Wilmington, Clinton Co.
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ON ENTOMOLOGY.

PROF. E. W. CLAYPOLE.....	Akron, Summit Co.
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ON ORNITHOLOGY.

L. B. PIERCE.....	Tallmadge, Summit Co.
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ON EXPERIMENT STATION.

MATTHEW CRAWFORD	Cuyahoga Falls, Summit Co.
B. F. ALBAUGH.....	Covington, Miami Co.
O. W. ALDRICH.....	Columbus, Franklin Co.

This report is published as an Appendix to the Report of the Ohio State Board of Agriculture (24,000 copies), and a separate edition for the members of the Society. To secure the benefits of this wide distribution of the report, and to save expense to the Society, the printing has been delayed to a later date than would otherwise be done—the time of the Agricultural Report.—SECRETARY.

(For list of members, see last two pages.)

*Deceased, April 29, 1889.

CONSTITUTION

OF THE

Ohio State Horticultural Society.

1st. This Society shall be known as the Ohio State Horticultural Society.

2d. Its object shall be to collect and disseminate information relative to fruits and other horticultural products, and to promote the taste for horticulture and rural embellishments among the people.

3d. Its officers shall be a President, Vice-President, Secretary, and Treasurer, who shall, in addition to their official duties, constitute a board, empowered to fill all official vacancies that may occur during the year by death or resignation. They shall be elected annually, by ballot, and hold their offices until their successors are elected; but the Secretary shall not enter upon the duties of his office until the first day of August following his election.

4th. The President shall preside and conduct all meetings of the Society, and in his absence the Vice-President shall perform the same duties.

5th. The Secretary shall record all doings of the Society, perform all correspondence, and, with the assistance of the President, collate and prepare the annual report and other matters for the public press.

6th. The Treasurer shall collect and hold all funds of the Society, and pay out the same only on an order of the Secretary, countersigned by the President.

7th. The membership fee shall be one dollar per year, and any person may become a member of the Society by forwarding the fee to the Secretary or Treasurer. Each member shall be entitled to a copy of the annual report, when printed, and any other documents that may be printed for the use of the Society.

8th. There shall be an *Ad Interim* Committee, consisting of the officers of the Society and ten other members, residents of different sections of the State, to be elected annually, whose duty it shall be to observe and take notes of new and rare fruits, the fruit crops, and others matters of interest to the Society, during the season, in their several sections of the State, and report the same at the annual meeting of the Society. This committee shall also hold meetings at such times and places as the President and Secretary may direct, for the inspection of fruit and fruit crops, attending horticultural exhibitions, etc.; a report of the observations of the committee to be published annually with the transactions of the Society.

9th. The annual meeting of the Society shall open on the second Wednesday in December of each year, at such place as may be designated by a vote of the Society, notice of the time and place, together with the order of exercises to be sent in due time to each member, by the Secretary. At this meeting, the President will be expected to

deliver an address, and the reports of the *Ad Interim* Committee, Secretary and Treasurer will be read, and the usual business transacted, besides discussion on fruits and other topics.

10th. This constitution may be amended, and by-laws may be adopted for the government of the Society, by a vote of two-thirds of the members present at any regular meeting.

RESOLUTIONS.

The following resolution was adopted by the Society, at its annual meeting, December, 1882:

Resolved, That the dues from each member of the Ohio State Horticultural Society shall be one dollar per year, payable annually in advance. Should any member become one year in arrears for dues, he shall be notified of that fact by the Secretary, when if he does not pay to the proper officer such dues within six months after such notice, his name shall be stricken from the roll of members of the Society.

That the Secretary shall provide himself with two books, at the cost of the Society, in one of which he shall keep a record of all the names of the members, and in which he shall charge up to each member his annual dues. The other shall be a receipt book so arranged that the receipts therein shall show the time to which each member has paid his dues.

Resolution adopted at annual meeting, December, 1888:

Resolved, That in addition to the regular duties of the *Ad Interim* Committee, it shall be their special duty to solicit members for the State Horticultural Society.

Ohio State Horticultural Society.

STATE FAIR MEETING.

CENTENNIAL YEAR, 1888.

It was decided, by its officers, to hold three sessions of the State Horticultural Society during the great Centennial Exhibition and Fair of 1888, which marked an era so interesting and important in the history of the State. It was thought proper that the progress in Horticulture should receive due consideration; and that the exhibits at the Centennial would offer ample matter for profitable investigation and discussion. The meetings were thereupon appointed to follow immediately upon the awards in the department of Horticulture, which were so arranged as to best accommodate, successively, the southern, middle and western sections.

The first meeting was held in the city of Columbus, in the Hall of the House of Representatives, on Thursday evening, September 6, 1888, opening at eight o'clock, President Hosmer G. Tryon presiding.

It was intended and expected that this meeting should occur after the first award of premiums on horticultural products at the Centennial Exhibition, but owing to the arrangements being incomplete, and the fruits not yet classified or in place, the premiums were not awarded according to announcement, on Wednesday, the 5th. As matter from this source was not available for this meeting, other subjects were called for by the President, and the following information was elicited in response:

N. H. Albaugh suggested that remarks and reports upon the behavior of new fruits the past season, from the experience of the members present, would be valuable and instructive. Reports upon Blackberries were called for.

L. B. Pierce remarked upon the Erie blackberry. It had been reported as not hardy in winter in some sections; but he had no winter-killing on his place. He had, however, found that some of the canes did not blossom as freely as they should, and bore but little fruit. It continued ten days longer in bearing with him than other varieties.

N. Ohmer attributed the non-bearing of some of the canes to injury by cold the previous winter.

Mr. Pierce replied that there appeared to be a difference in the canes of the Erie, and that under the same exposure and treatment some would bear well, and others not.

Secretary Campbell said that Prof. J. Troop, of the Purdue Experiment Station, had reported the Erie as hardy at Lafayette, Indiana, so far as they had tested it.

W. J. Green, of the Ohio Experiment Station, found the Erie about the same as the Lawton in hardiness; and thinks it will stand the winter in most parts of the State.

Mr. Pierce said the Erie was found on his place. He had sold it to Mr. M. Crawford, of Cuyahoga Falls, who in turn had sold it to Mr. J. T. Lovett, of New Jersey. He said Mr. Crawford thought the reputation the Erie had for hardiness was what had caused its sale. It had been claimed by some to be the Lawton, or a re-production of that variety; would ask if any present had found it so.

Mr. Green did not think the Erie and Lawton were the same.

N. Ohmer preferred the Taylor blackberry. It was productive, and very handsome; almost as large as the Lawton, and hardy. He also finds the Snyder desirable; hardy, productive and good. He also grows the Lawton, but prefers the Taylor and Snyder to all others he has grown.

N. H. Albaugh said late bearing was not peculiar to the Erie. He has had late berries from the Snyder; and considers this late, or continued bearing of varieties, as due to peculiarities of the season.

Daniel Duer, of Millersburg, presented specimens of the Yellow Transparent apple, which were picked the first of August. They were handsome and in good condition; and he thinks it the best early apple for general use and market.

N. Ohmer spoke favorably of the Wealthy apple. He has had it in bearing for two years, and commends it as one of the best and handsomest of the early apples, and especially fine for cooking.

Mr. Albaugh said the Yellow Transparent was the most successful and the most valuable of the Russian apples that he had grown; was much better than either the Early Harvest or the Red Astrachan. Red apples are usually most attractive in market; but if yellow apples are really fine, they will also be equally popular. The Wealthy is very fine in appearance; this year has been large and beautiful; regards it as extra fine for cooking; the best for sauce. Not as good as Grimes' Golden—for that is golden—but one of the best in its season. It is very hardy—having stood 56 degrees below zero.

The President asked if Yellow Transparent is as early as the Early Harvest.

Mr. Albaugh replied that it is as early, and fully as large as the Early Harvest.

Mr. McKelvey said he thought that in southern Ohio they did not want early apples; they do not sell; and he did not believe that for them the "coming apple" was the early one.

Mr. Pierce found early apples profitable: could always sell them for use on the railway trains. Red Astrachan brought him sixty cents a bushel, and other red apples good prices. Yellow or white apples did not sell as well.

Mr. Campbell inquired of Mr. McKelvey if the lack in demand for early apples in his section was not owing to the fact that this season all apples were unusually plenty.

Mr. McKelvey said not. It was always so.

Inquiry was made about the Ancient Briton and Agawam blackberries.

W. W. Farnsworth said he had grown the Ancient Briton to a limited extent, and so far as tested his impressions of it were favorable.

W. J. Green thinks the Snyder, Ancient Briton and Agawam the three best of those he has tested.

T. F. Longenecker asks if Agawam and Ancient Briton are not the same?

Answer: They are not.

President Tryon asks for information as to the success of the Lucretia dewberry, the present season.

N. H. Albaugh replied that owing to the hot, dry season the Lucretia this year produced a good many "nubbins;" there were, however, a good many large and fine berries, but not as many as usual. He thinks the Lucretia does best on thin, clay land.

W. W. Farnsworth called attention to a handsome red apple from the collection exhibited by Mr. Jas. Donipace, of Perrysburg. It is a fall apple, named Hiberna, quite attractive in appearance, of good size and form, splashed with bright red.

Mr. Albaugh said many of the Russian apples had been found, when tested in this country, subject to blight. Yellow Transparent, Tefofsky, Duchess of Oldenburg and Alexander appear to be exempt. Varieties that are winter apples in Russia, are summer apples here. He would advise planters to go slow on new Russian apples, though those mentioned are promising.

Mr. Donipace said he would also recommend very few of the Russians,

though he had tried a good many, and found some that he believed would prove useful.

Mr. Pierce thought we needed apples that could be grown in the arctic belt of central Ohio.

Mr. T. F. Longenecker had visited a good many orchards and examined the trees, where he had found injury on the south-west side, near the forks of the trees.

Mr. Campbell said that so far as he had observed and tested the newer introductions of Russian apples, there was little to recommend them except their reputed hardiness; and it seemed to him their planting could only be advised for localities where better varieties could not be grown.

W. W. Farnsworth spoke of the Hefflebower peach, recommending it as a very fine and productive variety, ripening just before the Early Crawford.

President Tryon said we need a good peach, ripening just after Hale's Early. He spoke favorably of the Early Rivers, an English variety.

Daniel Duer asked for information about the Kincaid apple.

J. S. Snider replied that it was a handsome, red apple, grown about Lancaster, which came from the first nursery planted in that section. It was called Kincaid from the name of a man who had it growing there, and because nobody knew what else to name it. It resembled Western Beauty, and had been thought by some to be that variety. He thought it was different.

Mr. Snyder said he had heard that grapes were rotting badly in the northern part of the State, and asked for information from those present.

J. H. Tryon, of Lake county, replied that his grapes, and those in that region had rotted more than usual this season. It began in July; afterwards apparently "let up," but commenced again in August and promised to be quite destructive.

President H. G. Tryon said when rot once began, it did not usually "let up," and in vineyards where grapes rotted one year, it was almost certain to appear the next, and be still more destructive.

Prof. W. R. Lazenby said grapes had rotted badly this season at Kelley's Island and throughout that region. The vines had also suffered from mildew of the leaves.

N. Ohmer asked for more general information about the rotting of grapes. It was stated that in some places vineyards were successfully bearing where rot had heretofore extensively prevailed.

Jas. Donipace, of Wood county, said that this year, grapes had rotted quite badly; only the Elvira and the Ives being nearly exempt. He had known instances where the rot had destroyed the fruit of whole vineyards in a very short time, in hot weather, following heavy rains.

Secretary Campbell said he had experimented to a limited extent with one of the proposed new remedies against rot and mildew, and had much reason to believe that the use of the sulphate of copper and lime remedies would, if intelligently used, greatly lessen, if it did not entirely prevent, the ravages of both mildew and rot in our vineyards. It was fairly demonstrated that both these maladies were caused by the attacks of parasitic fungi, that were perpetuated by minute spores, which, under favorable conditions of heat and moisture, spread with great rapidity. The sulphate of copper, with its various combinations, appears to have the power of destroying these spores, or germs, and also of rendering the foliage and the fruit of the vine impervious to their attacks. For several years, certain vines had been more or less subject to attacks of rot, and although the use of sulphur and lime, blown upon the vines through a bellows, seemed to check the trouble somewhat, it would continually recur in the same vicinity and upon the same vines. He had noticed that the rotting of the grapes was preceded by certain light-brown round spots upon the foliage, which destroyed and dried up the green portion of the leaves within their circumference. Prof. Scribner has stated that from these spots, which are not caused by *peronospora*, or mildew, the spores producing the rot are produced. As soon as these warning spots began to appear, the foliage was treated by thorough sprinkling with the mixture called "*eau-celeste*," or blue-water; and the vines so treated have escaped the rot the present season, apparently through the aid of this remedy.

Prof. W. R. Lazenby spoke of similar experiments, and with apparent success, with the remedy known as the "Bordeaux mixture," which seems to have been the most generally used, and the most effective of these new remedies. It should be remembered that all these remedies are preventives rather than cures, and that to be of much benefit should be used early, and before the injurious maladies have made their appearance.

L. B. Pierce related his experience with rot in his vineyard. It first made its appearance in one corner, and then spread progressively in a diagonal course from one end of the vineyard to the other. Mr. Pierce did not mention having used any remedy, or made any effort to arrest its progress.

Secretary Duval, of the Columbus Horticultural Society, upon invitation by the State Society, said their society would join and participate in the future meetings, and suggested that a programme should be issued for the benefit of the members and others interested.

Professor Lazenby suggested that certain topics for discussion should be selected, and some one person chosen to open the subject, to be followed by remarks from others. He thought suitable subjects might be found; and named "Lessons of the Exposition," "Fruits on Exhibition," and

"Causes of the absence of injurious insects the past season." He also proposed that ex-president N. Ohmer prepare a paper upon the "History of Horticulture in Ohio," to be presented at a future meeting.

Mr. Ohmer said he felt obliged to decline, on account of want of time, by reason of other imperative engagements which would render it impossible to comply.

On motion, the meeting was then adjourned to Wednesday evening of "Horticultural week," September 19th, to meet at the Hall of the House of Representatives, in the city, at 8 o'clock.

SECOND STATE FAIR MEETING.

HALL OF THE HOUSE OF REPRESENTATIVES, }
Wednesday Evening, Sept. 19th, 1888. }

The meeting was called to order by Vice-President W. R. Lazenby, at 8 o'clock P. M., who acted as chairman of the meeting, and addressed the assembly as follows:

I suppose it is generally understood that at the meetings of our State Horticultural Society, which are held as usual, in connection with our Fair, the characteristics of such new fruits will be discussed as may be exhibited at the Fair. Of course, inasmuch as we have a Centennial Exposition this year, the interest should be proportionally greater, and the attendance shows that this is likely to be the case. It will be understood that there are no prepared papers at this meeting such as we have presented at our regular annual meetings.

The first thing in order is the appointment of a business committee, and I therefore name W. J. Green, F. R. Palmer and W. S. Devol.

It is well known that our worthy President has recently suffered a very sad bereavement in the loss of his wife, and it will be proper for us to appoint a committee to express our heart-felt sympathy for Mr. Tryon in his great affliction. I therefore appoint as such committee, N. H. Albaugh and George W. Campbell.

We find at the exposition grounds some new fruits that are worthy of notice, which are not brought to our meetings here. I think it will be well that we have a committee on Novelties, to whom this line of exhibits can be referred for report at our meetings. As such committee, I appoint Messrs. W. W. Farnsworth, O. W. Aldrich and T. F. Longenecker.

As we have with us this evening a number of friends from a distance, we cordially invite them to join in our discussions, and hope they will feel perfect freedom to participate, and furnish us with notes from their horticultural experience that will be both valuable and interesting to us.

We should be very happy to hear from any of our friends from California, or any other persons present who have horticultural exhibits at the Centennial grounds.

The first business, as recommended by the committee, will be the examination and discussion upon the new fruits before us this evening. We have quite a number of them, and those who have brought them will state whatever is to be said in regard to them.

The first fruit in order will be the Peach. There are some very handsome and large specimens here, and the gentleman who has them on exhibition will please come forward and say a few words in regard to his fruit.

F. G. Withoft, of Dayton: I am a poor hand at making a speech, so I will simply describe my specimens in a few words. This is a new seedling cling, grown in this State. The gentleman who planted the seed reports that it was given him by a tramp, and the peach was first shown at the Cincinnati Horticultural Exposition. It has been since propagated to some extent, and the gentleman gave me the stock; and all my trees this year have borne a splendid crop. They began to ripen about three weeks ago, and to-day I picked nearly a bushel of peaches. I have a half-bushel at the Centennial grounds. Those gentlemen who have tested them will, no doubt, give their opinion as to their quality, and I would prefer that you have their opinion, rather than mine. Out of about a bushel that I picked to-day, over half a bushel were ripened evenly and perfectly, and they can be seen at the grounds.

President Tryon: Have you any suggestion with regard to a name?

Mr. Withoft: One gentleman suggested the name "Ohio Centennial," and another gentleman "Adams Cling," as it was grown in Adams county, but I will leave the name to be given by the Society.

Referred to the Committee on Nomenclature.

Hugh Keenan, of Quaker City, presented a peach claimed to be seedling, with the following remarks: I brought it on account of its lateness. I do not know whether it will mature or not, as it is not ripe. The most of our peaches in the neighborhood of Quaker City are ripe, and hence we are soon to be out of peaches. This peach may be of value on account of its late ripening. Perhaps it is a cling; and I would like to ask, gentlemen, if any of you can give a reason why peaches are all clings this year?

Another peach presented for name by Mr. Keenan, resembled Lagrange; and it was thought it might be that variety. Another very late variety, which was said to ripen in October, resembled Bilyeu's Late; but was not in condition to name with any certainty as to correctness.

Mr. Palmer: I believe, in Ohio, nearly all the peaches were clings this year, as the gentleman suggested. Varieties that are called free-stones were more like clings, and it is difficult to account for it. Some attribute it to the season—and others think it may be because the trees are affected with the "yellows." It is probably owing to some peculiarity of the season.

J. R. Hurst presented some peaches for examination. One sent by a gentleman from Chillicothe, claimed to be a seedling, which he had found of fair quality, and very satisfactory. It resembled the Smock in appearance. Mr. Hurst said: I am very anxious that it should be brought before the Society. I would suggest that this peach be referred to the committee for examination and report; I will also say a gentleman has suggested a name for the peach, and I think the name would be very appropriate; it is the "Ross." I found, the first of last week, a peach which appears to be a cling, and varies from any you have on the table, and may be worthy of the attention of the committee.

Hugh Keenan: I have been asked several times why the fall peaches ripen so unevenly, and why so many appeared to be clings. I do not think it was on account of "yellows," for our trees never looked healthier or made better growth than they did this year, and I have answered them in this way: The early part of the season, with us, was very dry, and hence the peaches got checked in their growth, or stunted; later in the season, after we had rains, the growth was somewhat uneven. In addition to this, I found that on the south side of the trees we had perfect clings, large and handsome, and on the north side of the same trees were free-stones.

If it is not out of order, I would like to say a few words about these apples; there are a few men who have them in our neighborhood. Those who have tasted this apple, which is called Outland Winesap, have declared it was the best they have ever eaten. In its keeping, and other qualities, it is fully equal to Grimes' Golden, and for myself, I prefer it to that variety. I have here, also, a sweet apple called Hall's seedling. It is a little past its season now, but we count it excellent for a sweet apple.

I have another here, which I got for "Pumpkin Sweet," and I would like to know the opinion of the Society with regard to it.

Secretary Campbell: If there are any experts on apples here, I wish they would come forward and examine this apple. As far as I can judge I do not think it is "Pumpkin Sweet."

W. S. Devol said he thought it was not "Pumpkin Sweet." Could not name it.

President Tryon: Time is passing, and we have several more fruits on the table to be examined. Is there anything further in regard to the new apples? If not, the next in order will be the Grapes.

Wm. Bundy, of Belmont county, presented specimens of a handsome white grape which he has named Colerain, with the following remarks:

"This is a new white grape of great promise in our neighborhood, and has been bearing now for three years, and my neighbors think it a very delicious grape. The grape will speak for itself, and those who wish to taste it, can have an opportunity."

Mr. Michael Witt, of Columbus, also presented specimens of the Witt grape, which has been several times before the Society, and was named after the originator, by the Society. It resembles the Colerain grape presented by Mr. Bundy so nearly that they might almost be taken for the same variety. Both these grapes were passed around the audience, and seemed to meet with general approval as to their quality.

Some large and well-grown specimens of the Woodruff Red grape were also exhibited, which attracted attention on account of their large size and bright red color.

Burr's "Ideal," a dark red grape, with well-formed, rather compact cluster, was presented by Geo. M. High, of Middle Bass Island.

Mr. Bundy also exhibited a medium large, black grape, said to be a seedling from the Concord, which it resembled in appearance, but was not thought as good as its parent, being more pulpy and not as well flavored.

President Tryon: We would like to hear from our Secretary in regard to the grapes on exhibition.

Secretary Campbell: I have a single vine of the Colerain, received from Mr. Bundy, but not yet in bearing. It is evidently a Concord seedling, having the vigorous growth and healthy foliage of that variety. From its appearance the second year after planting, I think it nearly, if not quite, equal in growth to the Concord, and it will probably be found adapted to all localities where grapes of its class succeed. The grapes on exhibition show for themselves that they are handsome in appearance and of good quality.

Of the Witt grape I have heretofore spoken, and have nothing new to offer. It is also a Concord seedling, and in general appearance and flavor much like the Colerain. Its foliage and growth are of the Concord character; rather more slender, and hardly as vigorous in growth as the Colerain. Both, however, appear to be worthy of general trial, and promising to be valuable acquisitions; and both appear to ripen as early, or perhaps a little before the Concord.

The Woodruff Red, as you see, is a very large and showy grape, handsome in color, and large, both in berry and cluster. It originated at Ann Arbor, Michigan, and is also said to be a seedling from the Concord, and even more vigorous in growth and productiveness than its parent. It has very large and healthy foliage, and has been found entirely hardy in Michigan, and its quality very satisfactory for a general market variety, the entire crop having been sold to fruit-dealers at Ann Arbor for several years at 8 cents per pound, wholesale. It ripens a little in advance of the Concord, and so far as I can judge, it seems to have more of the requisites for a profitable market grape for general use than any other red grape yet introduced. There have been differences of opinion as to the quality of this grape, from the fact that it has a distinct flavor and character of its own—sweet, rich and sprightly, with also something of the “native aroma,” called foxiness, which is agreeable to most tastes when not in excess—but to others it is not. Hence, while some say they like it better than Delaware, others are not suited with it. It is a grape for the many, and not for the few; and while there are grapes which I prefer for my own use, I know no other red grape that I would, all things considered, plant so confidently for profit as the Woodruff Red.

Mr. Burr’s “Ideal” grape I have growing, and find it a healthy and apparently hardy vine, with good foliage and medium vigorous growth. I have not fruited it, but Mr. High, who grew the specimens on exhibition, can tell us something more about it.

Geo. M. High: I have grown this grape for four years. It is a handsome, reddish grape, of fair size, and of good, but not best, quality. It has borne pretty well, and promises to be valuable, as it comes early, and will be a good grape for early market.

Secretary Campbell: Mr. Burr, now of Leavenworth, Kansas, but formerly of Columbus, Ohio, is the originator of Burr’s New Pine, and other valuable strawberries, which at one time were highly esteemed. He has also originated several new grapes, which have some reputation, since his removal to Kansas, among which are Early Victor and Jewel, recommended for early ripening, hardiness and good quality. Jewel is quite new, and its reputation is not yet established, being still under trial.

President Tryon: Is there anything further in regard to grapes? If not, we will take up the subject of Pears. I see we have a few here upon the table, and I think Mr. Streeper placed them there. What have you to say for them?

J. P. Streeper, of Chillicothe: In the fall of 1867 I planted the seeds of some Bartlett pears, quite a number of which grew. When they were of suitable size, I grafted them with the Winter Nelis. That pear not proving of much value, I re-grafted them with Seckel, leaving from 8 to 12

inches of Winter Nelis wood. The specimens here presented are the product from these trees, double-worked.

President Tryon: These specimens are interesting and instructive—indicating, as they do, the effects, or the influences of the stocks on double-worked pear trees. If there are any here who are interested in the different forms thus apparently produced in the same variety of fruit, it will be well for them to examine them closely after adjournment of the meeting.

Mr. Streeper stated that he had entered at the State Fair, both a plate, and a peck of these pears for premiums. The awarding committee gave him the premium for the peck, but ruled out the plate as not being the Seckel; but all were from the same trees.

President Tryon: We will now take up the the subject of Raspberries, and would like to have reports from the experience of those present, especially upon the newer varieties, and how they compare in value with the older kinds. The Hilborn raspberry is named.

T. F. Longenecker: Has fruited the Hilborn for three years, finds the fruit of excellent quality. In the spring, the canes sometimes appear to be injured, but they recover and prove to be very fruitful. Considers it one of the best for all purposes, but it comes rather late in the season, when the market is liable to be over-supplied.

F. R. Palmer. Has fruited the Hilborn four years; regards it as the best of all the black-caps in quality—much better than the Ohio. It is also very productive, bearing more on young plants than any variety he had ever seen.

W. W. Farnsworth: Finds the Hilborn very fine. Has had some blight on two-year plants. Young plants were good and healthy, and quality excellent. Mr. Farnsworth also spoke of the red varieties. He finds the Cuthbert the best of all the reds upon his sandy soil in north-western Ohio. Reliance was nearly worthless with him.

F. R. Palmer: Has grown the Cuthbert for ten years, and is sorry he ever saw it upon his clay soil in Richland county; it was very poor and unsatisfactory. He did not like the Reliance either. Brandywine and Thwack were both productive and healthy. They were poor in quality, but attractive in appearance on account of their fair size and bright color, and would sell. Shaeffer's Colossal was larger, better in quality and very productive, but did not sell as well in market as either Brandywine or Thwack, on account of its dull color.

J. R. Streeper says that in the southern part of the State, in Ross county, the Reliance raspberry has been the best of all the red varieties with him, and he has grown it with great profit.

The Ada raspberry, a new black-cap variety, which originated in Hardin county, was called for.

T. F. Longenecker reported the Ada as growing vigorously, entirely hardy, a fine healthy plant and productive, also of good quality, a little less in size than the Gregg and a little later also in ripening.

F. G. Withoft had seen no black raspberry that he liked better than the Ada. The Hilborn he has also found very fine.

W. C. Harris had found the Brandywine raspberry to succeed well on all kinds of soil. At his place, near Toledo, the Cuthbert had proven to be reasonably hardy. The old Doolittle black-cap he still found one of the most productive, and among the most valuable.

F. R. Palmer had not found the Ada, upon a limited trial, entirely satisfactory, but it might have been on account of not having received good plants.

W. J. Green, of the Experiment Station at Columbus, said the Ada raspberry had disappointed him last year, when it had blighted; but this year it seemed to have recovered and was growing well, and had borne a good crop of fruit.

Johnson's Sweet raspberry had also blighted last year, but did not recover, and had borne very little this season.

The Carman raspberry had not proven satisfactory at the Station.

The Golden Queen, he thinks, promises to be perhaps the best yellow raspberry we now have; somewhat better than the Caroline.

The Marlborough continues vigorous and healthy, and is of good appearance and fair quality, but not as productive as would be desirable.

W. W. Farnsworth reported the Marlborough as very satisfactory this year, and he thought it promised to be valuable. He also spoke favorably of a new black raspberry received from Mr. Palmer. He had only a limited experience with it, but thought it promised to be equal to anything he had.

F. R. Palmer: The raspberry spoken of by Mr. Farnsworth is supposed to be a seedling from the Souhegan. It is healthy, hardy and productive—stronger in growth than the Souhegan, and yields more heavily, especially at the first picking. It ripens early, and is gone before the Gregg and the late varieties come on. Mr. Palmer also spoke favorably of the Ohio raspberry, of which variety he has grown one hundred bushels this year.

Vice-President Lazenby then announced that the discussion upon fruits would be continued at the meeting appointed for to-morrow, the 20th of September, at 2 o'clock in the afternoon, at Grange Hall, on the Centennial grounds, where he hoped there would be a good attendance.

On motion, the meeting then adjourned to meet at Grange Hall, as above stated.

MEETING OF THE OHIO STATE HORTICULTURAL SOCIETY, HELD AT
GRANGE HALL, ON THE CENTENNIAL GROUNDS.

THURSDAY AFTERNOON, *Sept. 20, 1888.*

The meeting was called to order by the Vice-President, Prof. W. R. Lazenby, at half-past 2 o'clock P. M., with the following remarks:

I suppose it is understood by those present, why many of the active members of our society are not here. It is very difficult for them to leave their exhibits, and some have only a short time to stay, and feel that they want to see what is on exhibition; however, there is nothing to prevent those who are here, from having an interesting and profitable time, and we trust that others will be in directly.

The first topic for our consideration this afternoon is Blackberries. We would like to hear from those who have fruited the "Erie."

M. T. Thompson: I have a few Erie this year and the fruit is very desirable, made a good growth and came through the winter well, but could not say whether they would be productive enough for general cultivation or not. They made a very good growth this season. Mr. Lovett was at my place some time ago, and he said they looked encouraging. I have a blackberry called Thompson's Early Mammoth that has not been introduced. It is a very large blackberry, and is hardy. Its size and general growth is very much like the Wilson. It is a few days earlier, and I thought it of better quality. The bushes are just loaded, and I hope they will prove to be always as satisfactory, but I will say that the few plants I had put out last fall dried up considerably, the cause of which I could not understand.

W. W. Farnsworth: I do not remember whether the gentleman spoke of the quality of the Erie or not. The growth I consider very satisfactory, but we were disappointed in the quality; however, we have not grown it enough to say very much about it, except that the fruit was very handsome, and quality much like the Lawton.

N. Ohmer: I have not had much experience with the Erie. Have heard that it was tender in winter. It stood well the last winter, and grew a splendid crop this year.

Last year was an exceedingly dry one, but by giving thorough culti-

vation, and keeping the soil loose, I had blackberries as large as ever. I grew a large quantity of the Snyder blackberry last year, and this year also, and I expect to have them as long as I grow any. The Taylor pleased me very much. Of course the ground makes some difference, but I think that good cultivation had a great deal to do with my success.

F. R. Palmer: The Snyder is reported to be no better, and not as even in ripening as the Taylor, but I think the reason why people prefer it is because the Snyder is earlier.

W. W. Farnsworth: Thinks this Society should not recommend either the Lawton or the Kittatinny Blackberry for *general* planting, especially for market. In many places the Lawton is winter-killed, and the Kittatinny is quite liable to be destroyed by rust. They are only suited to specially favorable localities.

N. Ohmer: Would not recommend either Kittatinny or Lawton, except for special localities. For himself, he prefers the Snyder, all things considered, to any other for his locality.

W. W. Farnsworth: Both the Taylor and Snyder require rich soil and good culture to be grown profitably.

M. T. Thompson is well pleased with the Taylor. Kittatinny does not rust on his grounds, but does on his neighbors'.

Secretary Campbell spoke of the Ancient Briton blackberry as he had seen it growing in Indiana, near Richmond, in comparison with the Snyder, where they were growing in the same field, side by side. The Ancient Briton appeared rather more vigorous in growth, somewhat larger in berry, a little earlier, and also more productive. The party growing it said it was equally as hardy as Snyder, and, on his grounds, he gave it the preference.

George W. Trowbridge, of Hamilton county, said we had as yet no first-class blackberry that was adapted to all localities. If we had a berry as large as the Lawton, as good as the Kittatinny, and as hardy and productive as the Snyder, adapted to all localities, it would be an acquisition indeed, and a fortune to its originator.

W. J. Green thinks we have in the Snyder all these qualities except size. He thinks Ancient Briton better than the Taylor.

N. Ohmer spoke of his method of pruning, pinching or cutting-back the blackberry canes, which was much like his treatment of raspberries. Cuts back the main stems three to four feet high, to induce lateral growth or branching at the top and down the sides; after wood is matured, shortens the side branches according to the strength of the canes. By this means he gets larger and finer berries, and still an abundant yield, which brings good prices in market. It is the *man*, and the culture, that produces perfect fruit, rather than the *variety*.

President Tryon: The next topic assigned by the committee is "Mildew and Black-rot—experiments, with results and conclusions." Discussion to be opened by George M. High, of Middle Bass, Ohio.

G. M. High: Gentlemen, I have just written a paper giving my experience for the last two or three years. I commenced these experiments two or three years ago, on rather a small scale, but was so well satisfied with the results, that last year I extended my experiments, as I have endeavored to show in the paper I have prepared and will now read:

MILDEW AND GRAPE ROT.

BY GEO. M. HIGH, OF MIDDLE BASS, OHIO.

For the past three seasons, I have experimented with sulphate of copper mixtures for the prevention of mildew and rot; the first year (1886) upon a small number of vines, and was so well satisfied with the results, that in 1887 I used the remedy (Bordeaux mixture) upon between four and five thousand vines. Some four thousand were Catawbas, and the remainder various other sorts. For the first year, in sixteen, we were, under this treatment, without mildew or rot.

The labor of applying the mixture as we at first did, with common whisks, was great; but I was so confident of good results that I this spring purchased a Nixon barrel-sprayer and force pump; and instead of using the Bordeaux mixture, as heretofore, used *eu-celeste*. In the experiments of last year it was found to be just as effective, with less cost, and much more readily sprayed. The first two applications were prepared as follows: One pound of sulphate of copper dissolved in two to three gallons of hot water; when cold, adding one pint of spirits of ammonia, letting the mixture stand twenty-four hours, then pouring off the clear liquid, or about two-thirds of the bulk. It was claimed that by leaving the sulphate of ammonia it would scorch the young and tender foliage. It did so even with us, where a little too much was applied. After taking off the clear liquid, we added to what was left, from twenty to twenty-five gallons of water—the latter quantity for the first spraying. The first application was made upon all the vines on the 7th and 8th of June, ten days before blooming. A second spraying on what I shall designate as the east block, was made on the 18th of June—about two thousand Catawbas—just as they were going out of bloom. The other, or west block, was left until the berries were about the size of buck-shot, and then sprayed with the balance of mixture left over on the 18th. This was June 25. Heavy rains on the 29th and 31st of June washed these vines almost clean—much more so than those sprayed on the 18th. Either the mixture had lost its strength, or the heavy rains so soon after applying, impaired its efficacy. I shall not use any old, mixed stuff in the future. As I wished to make thorough work in my experiments, this block was again sprayed on the 6th of July. On the 14th of July I gave the third spraying to east block. The entire lot of vines experimented with, were gone over on the 7th of August, and again on the 20th of August, which was the last application. The three last sprayings were with *eu-celeste*, without dilution.

The Results.—The east block, up to this date, 28th of September, has not a mildewed or rotten berry to the vine. On the west block, from 7 to 10 per cent. have rotted; foliage healthy and will ripen most of the fruit.

The block of untreated Catawbas lies between the two lots of vines operated upon, and they were in no manner, as to cultivation, treated differently from the sprayed ones. From 25 to 35 per cent. have rotted, and many vines are almost denuded of foliage—so much so that the larger part left, will not ripen their fruit. To demonstrate more fully: upon some forty or fifty vines of Mo. Reisling that were sprayed four times, the fruit and

foliage for the first time, is perfect. Two of my neighbors, who grow the same sort, have scarcely a berry left, and with badly injured foliage.

I also applied the remedy to one-half of a two-year-old lot, and the result would convince almost any one of the efficacy of the *eau-celeste*. The treated vines are green and fresh to-day, looking like iron-clad varieties in comparison with same sorts along side.

I feel pretty well satisfied that if I had treated the west block with fresh prepared stuff they would have resisted the rot as well as the east block.

To those who expect to try the remedy another season, I would urge the necessity of making the application early—some days before blooming; again whenever the little blue spots are washed from the leaves, not making the time too long, as the new growing leaves need protection, which is only made sure by spraying.

I believe the cause of failures in the eastern states last year, was by not spraying soon enough—waiting till after the disease had commenced its attacks before making the application. When the untreated portion of my vineyard had not rotted to exceed 15 per cent., I thoroughly sprayed one row through the center, 125 vines, drenching the foliage on both sides of the row; up to this date, 28th September, no difference can be seen from the adjoining, untreated rows.

The cost is a mere nominal matter, in comparison with the benefits derived. Two pounds of sulphate of copper and one quart of spirits of ammonia is ample for an acre. Four sprayings during ordinary seasons, I believe, will be amply sufficient. I have used the remedy on not less than fifty varieties, without detriment to the foliage of any. In this and the adjoining county of Erie, several thousand acres of Catawbas are grown, and I am satisfied, from observation and information, there is not a vineyard but has had from twenty to more than fifty per cent. of rot in the different localities, varying as to situation.

The clusters are nearly perfect upon my east block. The difference in the cost of gathering will more than pay for all the cost of material and labor, outside of spraying machine; and that will last for years, if proper care is taken of it, after using.

I also applied the Miller remedy (copperas) on about seven hundred vines, scattering at the rate of a pound to the vine, on the 18th of June. Up to this date, cannot see the least benefit over untreated Catawbas along side. Copperas must dissolve, the first rain after applying. The only way it could be of any lasting benefit, would be through the roots taking it up after rains had made it soluble. At any rate, two seasons' trial, with 1,800 pounds, has not done our vines any perceptible good. *Eau-celeste* is cheaper and much easier handled.

Impressed as I now am, through the experience of 1886 and this season, I shall in the future (till proven otherwise) consider *eau-celeste* a preventive against mildew and the rot we have here.

Considerable discussion followed the interesting and valuable paper by Mr. High. The Secretary said he had also experimented to a limited extent, the past season, using the *eau-celeste*, prepared nearly after the formula used by Mr. High, and with apparently good results in the prevention of both the mildew and rot. He has noticed for several years that in certain locations the same vines had more or less rotten grapes each successive year, while other portions of his little vineyard remained exempt. Picking off and destroying the affected berries as soon as the rot appeared, seemed to hold the disease in check, but did not eradicate it. He had noticed that the rot was accompanied or preceded by the appear-

ance upon the leaves of a sprinkling of yellowish, brown spots, different from those produced later by the *peronospora*, or mildew, as these spots, though they destroyed the green portion of the leaf within their circumference, were dry, and unaccompanied with the white fungus that was always present with the mildew. Eau-celeste was carefully applied to both the upper and under surface of these affected leaves, and the vines also sprinkled with the mixture. This treatment seemed to arrest the formation of the spots, and the past season, the rot did not appear upon the vines so treated. The application was made three, or perhaps four times; but only to the vines upon which the spots appeared. So far as could be judged by one year's trial, the treatment seemed to be a complete prevention of rot, and taken in connection with Mr. High's experiments may be regarded as nearly conclusive as to the value of the remedy. It would also seem to be of the greatest value to grape-growers, and to indicate that with its assistance successful grape-growing will be possible over a much larger area than heretofore, and varieties that have been excluded from many places on account of liability to rot and mildew may be grown again with both pleasure and profit.

Mr. High said he had but little to add to what he had given in his paper. He had confidence in the remedy, if applied in time, as a preventive of rot. In reply to a question, said he had used copperas or sulphate of iron under the trees with no apparent benefit.

F. C. Miller, of Tuscarawas county, had used copperas in his vineyard by sprinkling on the ground under the vines, and after its use the rot which had already commenced among his grapes ceased; and it had appeared to be a remedy which not only arrested the rot, but prevented its recurrence.

The Secretary said it was now claimed by Prof. Scribner and others that if the rotten grapes were allowed to fall and lie upon the ground until next spring, they could generate spores which would produce first, the leaf-spots before mentioned, and from these spots other spores were produced, which were capable of causing the rot upon the grapes. If this was correct, the use of copperas upon the ground might have the effect of killing the spores upon the fallen grapes, and thus prevent the further spread of the rot.

Vice-President Lazenby asked whether the disease in question, was the brown, or black rot.

Mr. High said Professor Scribner had pronounced it principally *brown* rot. If the black rot existed among their Island vineyards, it was only to a limited extent. He said also that the better appearance of his vineyard where treatment had been used, both in the foliage and fruit, was so apparent that his neighbors, noticing the great difference between his vines and

theirs, were satisfied of the value of the remedies, and he thought they would be more extensively applied hereafter.

Vice-President Lazenby thinks we are on the right road to success in this matter, and considers the experiments reported as both instructive and valuable. He would like to have the copper remedies tried upon the foliage of strawberries as a preventive of the rust, and also upon other plants subject to attacks of injurious parasites.

F. C. Miller reported trial of both sulphate of copper and iron upon strawberry plants, without apparent benefit.

The Chair then announced a paper by Mr. Clarence M. Weed, Entomologist of the Ohio Agricultural Experiment Station, upon "Recent Developments in Insect Warfare."

RECENT DEVELOPMENTS IN INSECT WARFARE.

BY CLARENCE M. WEED,

Entomologist Ohio Agricultural Experiment Station.

The "battle of the bugs" is doubtless one that must be waged as long as the soil is tilled by man, but the weapons of warfare will be continually improved, and destroying agents will frequently be changed, until, as I firmly believe, we shall be able to subdue every plant-attacking insect. If we take the remarkable development in the practical application of a knowledge of insect-life made during the last twenty years as a criterion of what can reasonably be expected in the future, we may indeed feel encouraged. Think for a moment of the helplessness before insect attacks of American farmers twenty years ago. The army-worm held undisputed sway, and destroyed fields and meadows at its own sweet will. The chinch-bug ravaged unmolested, the fair fields of grain in the prairie States. The Rocky Mountain locust swept down in countless swarms upon the western pioneers and devoured every green thing upon the face of the earth. The codling moth ruined the apples, and the curculio devastated the plums; the rose-beetle destroyed thousands of bushels of peaches and grapes; the currant-worm defoliated the currant and gooseberry bushes, and dozens of other pests attacked various fruit and field crops. But, thanks to the earnest efforts of a host of horticultural and entomological students, we are now in a position to successfully combat the majority of these arch-enemies of agriculture.

INSECTICIDE MACHINERY.

I desire first to call your attention to the marvelous improvement in the weapons of insect warfare, especially those to be used in orchard practice. Ten years ago, spraying outfits were almost unknown, but now we have upon the market, dozens of machines which do effective work, varying in price from a hand-pump, costing one or two dollars, to a field and orchard machine, costing seventy-five dollars. To illustrate this fact more forcibly than can be done by words, I invite an inspection of the insecticide machinery shown in the exhibit of the Division of Entomology of the Experiment Station at the Ohio Centennial. A spraying outfit is now nearly as essential to the fruit-grower as is the hoe.

REMEDIES FOR THE PLUM CURCULIO.

In the practical work of fighting insects, very great progress has recently been made. The remarkable effect of spraying orchards with the arsenites is too well known to need

more than the briefest mention in this connection. This is fast becoming the universal practice with commercial fruit-growers, and it is safe to predict that it will ere long be as common as the application of these same poisons for potato-bugs is to-day. But the fact that this same method may be successfully used in fighting the plum curculio is not so generally known; and merits more extended notice. I may mention, especially, the series of elaborate experiments upon plums, cherries and pears, made at the Station this season under my direction. The essential details of the cherry-experiment are given in the following summary:

1. These experiments were undertaken to learn what effect the application of London purple and lime to cherries soon after the fruit forms, would have in preventing the injuries of the plum curculio, or, in other words, in lessening the number of wormy cherries.

2. For the carrying on of the experiment, a half-acre orchard of bearing trees was set aside, and a part of it treated, while the rest was left as a check.

3. London purple was applied in a water-spray, mixed in the proportion of one-half pound to 50 gallons water.

4. Lime was applied in a water-spray, mixed in the proportion of four quarts to 50 gallons, until the leaves were whitened.

5. The cherries were critically examined when nearly ripe, and the exact number injured by the curculio, recorded. In this way, 22,500 cherries were individually cut open and recorded.

6. From eight trees sprayed thrice with London purple, 8,000 cherries were examined, of which 280, or 3.5 per cent., were wormy, while from seven companion trees not treated, 7,500 were examined, of which 1,086, or 14.5 per cent., were wormy. This represents a saving of 11-14ths, or 75.8 per cent. of the fruit liable to injury.

7. From two trees sprayed four times with London purple, 2,000 cherries were examined, of which 59, or 3.45 per cent., were wormy.

8. Two quarts of cherries from each of these lots were chemically examined at the time of ripening by Prof. H. A. Weber, and showed no trace of arsenic in any form.

9. Five trees, sprayed four times with lime, yielded 465 wormy cherries out of 5,000 examined, while five check trees yielded 778 wormy cherries out of 5,000 examined. The percentage of the former was 9.3, while that of the latter was 15.6, which gives a percentage of benefit from the treatment of 40.3.

The conclusions reached from these cherry experiments, combined with those of the plum and the pear, may be expressed as follows: First, a large proportion (probably about three-fourths) of the plums, pears and cherries liable to injury by the plum curculio may be saved by spraying with London purple, in the proportion of one ounce to five gallons of water, applied two or three times, soon after the blossoms fall. Second, if an interval of a month or more occurs between the last application and the ripening of the fruit, no danger to health need be apprehended from its use. Third, lime is not so effective on cherries as on plums, perhaps because it is more difficult to get the former well coated, but that it seems to compare favorably with London purple in its preventive effect upon the plum; although of course it must be remembered that while one simply drives away the insect, the other kills it.

I may add that similar conclusions as to the effect of London purple have been independently reached this season by Prof. Forbes in Illinois, and Prof. Cook in Michigan, while I have seen many practical fruit-growers in this State who report successful results.

HELLEBORE FOR CURRANT-WORMS.

It has long been known, that the imported currant-worm (*Nematus ventricosus*) may readily be destroyed by powdered white hellebore; but a large proportion of those interested, either do not know it, or knowing it, do not put their knowledge into practice. As a matter of fact, it is as easy and practicable to prevent the injuries of this insect as it is

to prevent those of the Colorado potato-beetle, and inasmuch as hellebore is an effective and comparatively safe remedy, there is no excuse for the somewhat common practice of using Paris green or London purple in its stead. There is on the Station farm, a half-acre patch of currant and gooseberry bushes which have been attacked for years, by the currant-worm. This season the insect has been kept under control very effectively, and the bushes are now in good foliage, though early in the spring before the first treatment, the worms were so thick as to threaten complete defoliation. By May 5th, the worms had began work in numbers, and the bushes were thoroughly sprayed with a solution of one pound of powdered hellebore to fifty gallons of water. A Nixon barrel machine on runners, was used for the purpose, it being drawn by a horse between the rows. One person worked the pump and drove, while another directed the spray well into the leaves, both above and below. Two barrels (or one hundred gallons) of the liquid, went well over the patch, and three hours' work sufficed to finish the task. Two days later, (May 7th) most of the worms were on the ground beneath the bushes in a dead or dying condition, although a few live ones still remained on the leaves.

The period of egg deposition was not over at the time of the first application, and the worms continued hatching for a week or more later, so that it was necessary to apply the poison again on May 16th. The day following, the worms were lying beneath the bushes by the hundreds, dead and dying. I picked up eight of them, from one square inch of soil surface. This application proved sufficient, and it was not necessary to treat the patch again during the season. One bush left untreated as a check upon the experiment, was completely defoliated.

So much for the results. What was the cost? Work of man, boy and horse may fairly be estimated at thirty cents per hour, so that the six hours' work amounted to \$1.80. Hellebore retails at twenty cents per pound. The four pounds used, cost eighty cents. Total expense (including interest on machine, which is insignificant), was \$2.60, or say in round numbers, five dollars an acre. Currants sell readily in the Columbus market, for a shilling a quart, so that forty quarts would pay for fighting the worms on an acre of bushes even when the labor of man, boy and horse had to be hired. But on most fruit-farms this labor would cost practically very little, so that the only outlay would be for hellebore, which would amount to less than two dollars per acre. In the light of this experience, need the small fruit-grower fear to plant these neglected fruits because of currant-worms?

A REMEDY FOR THE ROSE-BEETLE.

One of the worst enemies of Ohio fruit-growers, especially in the eastern part of the State, is the rose-beetle, a pest for which no practical preventive has hitherto been known. Last June, however, in reply to a query from Mr. E. A. Dunbar, of Ashtabula county, I suggested the use of a lime-water spray, applied so as to give the vines and trees infested, a thorough coating of lime, and the result can best be given in Mr. D.'s own words, as communicated to me in a recent letter. He says:

"A thorough application of the remedy advised by you, was undoubtedly the means of saving me many dollars' worth of fruit, for which I feel profoundly grateful. * * * Bugs appeared this year, June 12th. One application of coal-oil emulsion to a few grape vines and rose bushes killed most of the bugs which were there, but others soon came; remedy of no use. I then mounted my Field force pump on a 40-gallon cask set on a stone boat. I slaked about a peck of lime for each barrel, and the motion of the boat kept the lime in solution. One man held the pump, and the other directed the spray on one side of one row at a time, as fast as the horse walked down the row, and we soon had the vineyard thoroughly whitewashed, well on to the fruit and under the leaves. I was disappointed at first, in apparent results, as the bugs continued to be quite numerous, but after a few days, they cleared out, having hurt the grapes very little, and I have a heavier crop than for several years past. The west side of the peach-orchard being nearest the house, and showing very few bugs, I did not visit the east side for several days, and

when I did, the bugs had got a good many peaches. I at once whitewashed the peach orchard in same manner as the vineyard, with exception of the west row, and the bugs all imigrated to that row in the course of a day or two."

In the light of this experience, it seems that the progressive fruit-grower can save at least a large part of his crop when the rose-bug swarms appear, by so simple, cheap and safe a method, that there is little excuse if it is not practiced.

In answer to inquiries as to the fact that the curculio fed upon the leaves of the trees and upon the substance of the plums, Mr. Weed said he had put a plum in a jar with a curculio, and that the whole surface of the plum was gnawed or eaten over before the curculio died. He thought also he had detected appearances upon the leaves which showed that the curculio ate them also. This would account for the reports that spraying of trees with liquid poisons had proven a remedy for the attacks of the curculio.

The Secretary said Mr. Weed's paper, and his experiments, were both very interesting and valuable, as they give us just the information we needed to successfully combat the curculio and other kindred insects so destructive to our stone-fruits. It had been the prevailing opinion that the curculio could not be reached by liquid poisons, because it was thought the plum was only used as a place for its propagation. This discovery seems second only in importance to that of spraying the apple trees for the destruction of the codling moth.

Messrs. Geo. W. Trowbridge, N. Ohmer and O. W. Aldrich expressed similar views; and were of the opinion that the curculio did feed upon the foliage of plum and other trees, and could be destroyed by means of poisons in liquid form upon the leaves. Mr. Ohmer spoke of the strength of the poison to be used, and had found for ordinary use, six ounces of Paris Green or London Purple sufficient for fifty gallons of water. He said Mr. Moody, of New York, who had been very successful with its use for destroying the codling moth on his apple trees, used one pound of the poison to one hundred gallons of water. This would kill the larvæ of the moth without injury to the foliage of the trees.

Mr. Weed gave the preference to London Purple; thought it quite as effective, and made a better solution than Paris Green.

President: When the first topic was called up this afternoon, Mr. Aldrich was not present. As he was to open the discussion, if Mr. Aldrich has anything to say on that subject, it will be well for us to return to it, for a short time.

Mr. O. W. Aldrich: I do not know whether I can say anything that will be of interest to the Society. The blackberries this season were so much injured by the winter as to bear but little fruit. We have no varieties which pay to cultivate here, as those which will stand the winter are

too small to be profitable, as the wild berries fill the market in favorable seasons. What we need, is a berry as large as the Lawton, and as hardy and productive as the Snyder. The last two winters have been of a different character, and the effect has been different upon many of the varieties. Some of those which stood the winter a year ago without injury, were badly damaged last winter, while some of the tenderest kinds were but little hurt.

Among the newer kinds, I find that the Erie, which is claimed to be perfectly hardy, was seriously injured the last two seasons. The Minnawaski was also considerably damaged. The Lincoln, from Illinois, stood the winter perfectly, but the fruit was quite small; but as the plants were only one year old it may do better in future. The Sadie, from Iowa, came out alive to the tips, but the plants being small, bore only a few specimens. I have an undisseminated variety, which also proved entirely hardy, which I hope may prove valuable. It is quite distinct in growth; the fruit is large and round. It is said to be very productive.

Among the early varieties usually considered tender, the Early Cluster stood the winter the best, and produced the most fruit.

There is an early variety called the Early King, which has proved perfectly hardy. It is about as early as the Early Harvest, and is about the size and appearance of the Snyder; it is too soft for market, but for the table it is all that can be desired.

The Nevada, which stood the winter before perfectly, was considerably damaged last winter. I have the new dewberry called the Windom, which came through the winter all right, but the fruit on young plants was quite small. The Bartle is quite tender. The fruit is large and of good quality, and is quite early, equally so with the Lucretia, which has not proved either hardy or productive on my grounds.

President Lazenby calls for discussion upon the "Effect of Thinning Fruit."

W. W. Farnsworth thinks it advantageous to thin out fruit upon over-bearing trees; because, in addition to the improved size and appearance of the fruit left, he believes a bushel of small fruit exhausts the vitality of a tree far more than a bushel of large fruit, mainly on account of the greater quantity of seeds in the small fruit.

Geo. W. Trowbridge also thinks it of great advantage and profit to thin out fruit when too thick upon the trees; and that the habit of bearing too heavily is a disadvantage, rather than a recommendation, to any variety.

W. C. Harris regards thinning the fruit as a matter of the greatest importance—as over-bearing not only makes the fruit small and inferior, but is very injurious to the health of the trees.

President Lazenby: Mr. Farnsworth makes a good point upon the advantages of thinning fruits, by reason of diminishing the quantity of seeds. It is well-known that the production of seed makes] a great demand upon the vital powers of the tree, and that large fruit usually contains less seeds than the smaller fruit of the same kind. It is also known that the seed will produce more ash than the flesh.

The Business Committee reported that the remainder of the programme would be left for the evening session, which would be held at the State House, at 8 o'clock.

The Committee on Novelties also reported, through their Chairman, W. W. Farnsworth, that they were making some collections, and would report at the evening session.

The President said if there was nothing more to be brought before the meeting, a motion to adjourn would be in order, and on motion, the meeting adjourned to meet at 8 o'clock P. M., at the State House.

STATE HOUSE, THURSDAY EVENING, *Sept.* 20, 1888.

The meeting was called to order at 8 o'clock, Vice-President W. R. Lazenby in the chair.

The President announced that unfinished business and reports from committees would be first in order. He also extended a cordial invitation to all present, whether members of the Society or not, to participate in the discussions. There would be no formal papers presented at this meeting; only discussions and remarks upon the fruits upon exhibition, and the topics proposed. Mr. W. W. Farnsworth, chairman of the Committee on Novelties, has some new fruits to present, and we will now hear his report.

W. W. Farnsworth: In addition to what has been heretofore presented, we have additional specimens of the new seedling clingstone peach exhibited at the Fair by Mr. Withoft, and for which he desires a name and description by the Society. We have also a fine looking peach, said to be also a seedling, and a clingstone, from Ottawa county, which is entered for premium for best new variety. It has been called the "Lakeside Cling." An apple, also, which is thought to have some merit, is presented by Mr. O. W. Aldrich, believed to be a seedling, and a sweet apple of fair quality; the gentleman who brought it wished it named, and suggested "Clinton Sweet," as the apple originated in Clinton township.

The President called upon Mr. N. H. Albaugh for some further information about the large clingstone peach from Mr. Withoft.

Mr. Albaugh said he had little knowledge of the peach beyond what he gathered from its character and appearance. It was sold to Mr. Withoft as a new seedling, said to be from a peach-stone given to the grower by a tramp in exchange for his dinner; but he thought the story might well be taken with some grains of allowance. The peach, however, had every appearance of being a valuable acquisition.

T. F. Longenecker thought the tramp story might go with that of the wild-goose plum. The flavor of the peach was good, and its appearance very attractive.

Mr. Ohmer: Mr. Withoft asks the Society to give his peach a name; and among others, the name of "Diamond" or "Diamond Cling" was suggested, either of which, he understood, would be satisfactory to Mr. Withoft.

The Secretary remarked that in reference to names of new fruits, the American Pomological Society, at the recommendation of its President, had adopted a rule excluding all uncouth, extravagant or unnecessarily long names, and he thought we should, as far as possible, adopt the same method; and, if satisfactory to Mr. Withoft, it would probably be better to call the peach simply "Diamond."

The motion was then made and seconded, that Mr. Withoft's peach be named "Diamond," which was unanimously carried. [A description, with a drawing of the peach, was made by the Secretary, which will be found in the following pages with other new fruits.]

Messrs. Farnsworth, Trowbridge and Aldrich all spoke favorable of the "Lakeside Cling" peach, regarding it as of good quality, and worthy of recommendation for trial; but no formal action was taken by the Society in regard to it.

O. W. Aldrich exhibited a seedling sweet apple, raised by Mr. Amasa Webster, of Clinton township, Franklin county, for name, and proposed the name of "Clinton Sweet." The apple is very large, color green, with russet on one side, ripens about October 1st; flesh very white, said to be excellent for canning, retaining its color perfectly in glass jars.

There were upon the table some fine specimens of the Woodruff Red grape; and as some further information of the character of this grape were desired, the Secretary said Mr. Miller, of Tuscarawas county, had it in bearing, and could, doubtless, give us the result of his experience.

President: We would like to hear from Mr. Miller about the Woodruff Red.

C. F. Miller: The Woodruff Red grape we consider one of the most promising grapes on our grounds. It is perfectly hardy, quite productive, good size of bunch and berry, quality very good. Although it does not

fully color until quite ripe, it is quite palatable before fully colored or ripe. My little granddaughter—six years old—is quite a connoisseur in small fruits; she was often waiting for me under the Woodruff vine, and would invariably say, "Grandpa, why don't you plant more Woodruffs? they are the best grapes we have." And so say all of our family. Last year we fruited one vine only, three years old. It had twenty-five large, perfect bunches.

President W. R. Lazenby: Our next topic is "Lessons from the Exposition." I believe that I am so unfortunate as to open the discussion on this subject.

It is known to many here, that the first great Exposition was held in the year 1851, in London. That was the first exposition that could be called a "World's Fair." Of course, since then, many of our counties and states have held Fairs, quite frequently. We may say, in some parts of the country, we have an Exposition nearly every year. This year we have a Fair, the like of which has not been held for many years past.

Of course, there must be some value derived from these Expositions. The best part of these exhibitions is probably the people who attend them. Anything that brings people of different branches of industry together, is a good thing. The organizations that cultivate the social element are always the most successful—those that do not, disintegrate, and fall to pieces.

If we are at all observing, we must have noticed the many valuable features of our Exposition, and if we do not, it shows that we have not a full sense of its worth. There are, of course, many lessons that can be learned from an Exposition, whether it is large or small.

One lesson, I think, many of us have learned, and that is, that it requires a great deal more time and care to properly decorate and arrange an Exposition than is generally thought. I do not care what the character of the exhibit may be, it involves a great amount of labor to place it in proper position.

This is evident from the fact that many of our exhibits were incomplete at the opening. It was the wish of all, to have the exhibits ready at the day of opening, but many of them had not counted the work, the labor, the painstaking care that is necessary to properly arrange an exhibit, and therefore we found there was a considerable delay.

Another lesson is this: that we do not learn quite as much at these exhibitions as perhaps we ought.

I have attended State Fairs frequently, County Fairs more frequently, and I presume I have attended, at least, fifty State, Township, and County Fairs, where there were various exhibits in Horticulture. Probably I learned something from all these, but I can hardly say, now, what it was;

that is, I have no definite impression of what the value of these exhibits has been. The fault has been, I think, in myself, rather than in the Expositions. Probably there are some reasons for this failure to learn. One reason is that we are confused, to some extent, by the great number of articles that are before us.

We enter an exhibition building on the grounds of our State Fairs, and we see such a multiplicity of things, in the various departments, that we do not undertake to give them very close attention; and I think that this feeling is more prominent, where there is a large collection in one building.

When you enter a building and wander around for an hour or two, you become exceedingly tired, and you begin to have a feeling that you must hurry and get through.

I think no one can visit our Exposition without feeling that he is ushered into the light and progress of the 19th century.

Perhaps Horticulture has not kept pace with the progress in other directions, and yet I am inclined to think that, considering the lapse of the short amount of time that covers the improvement of many of our varieties of fruits, I am not sure but what the progress there has been as great as in any other department. There is one thing, I think, that must impress us all, when we visit our Expositions and Fairs: the connection between the useful arts of Agriculture and Horticulture, and the departments of Education, Science, etc. One thing is certainly very gratifying when we visit the Horticultural Society exhibits, this year, namely, the correct naming and plain labels placed on the fruit.

As we go through, we see the plain grouping and naming of fruit, and that is, of course, a very great advantage, and I think that at all our Expositions and State Fairs, although they may be somewhat smaller in other seasons, this plan of distinctly labeling should be adopted.

With the object-lessons brought before us at these Expositions, we should have specialists to speak on subjects, such as grapes, and other fruits and their culture, and this would add greatly to the interest and usefulness of our Fairs. We have already made many improvements—but we can, and should, make still more.

I should be very glad to hear, now, from others on the subject. I feel myself that I have not had time to examine the exhibits as thoroughly, or to observe them as carefully and perfectly as I could wish.

W. W. Farnsworth: I have attended a great many Fairs during the last few years, and I find that most people go to the Fair to be taught by striking object-lessons, rather than to search out facts for themselves, by patient study. Some go merely for amusement, and nearly all expect more or less amusement with the instruction.

I find that when a man comes here with a fixed purpose to study up a particular subject, he seldom goes home dissatisfied.

I was much amused at a remark I heard a gentleman make yesterday: He said, "I have been all through the Exposition;" and I presume he had, but I doubt whether he had learned much from his rapid glance over it. I presume he could tell more about the side-shows than anything else, when he got home.

Mr. N. H. Albaugh: I was somewhat surprised at these statements, for there probably never has been a more fruitful season than the present, and I do not believe we have ever had a better show than this year; and I can say that we need never be ashamed of Ohio as a horticultural State.

Theo. F. Longenecker: It is true that we have had a fruitful year; but, notwithstanding, we find a large proportion of our fruits injured by insects; the curculio has got in his work as usual. I have noticed many trees where apples and other fruits are stung, and while there is much fruit upon trees, there is still more lying upon the ground, which has been destroyed by insects. I speak of this not to discourage, but to stimulate all to use the remedies recommended for these destroyers.

The President: There is another topic that comes in very appropriately now. We would like to hear from some one in regard to the manner of judging, and of the best way of exhibiting fruits at our exhibitions. I think there should be a scale of points adopted, according to the most important characteristics of the fruit, founded upon what would be our ideal of a perfect apple, peach, grape, or other fruit.

O. W. Aldrich: As one who has had something to do with gathering the exhibits for Franklin county, I have realized that there are certain things which should be taken into consideration in making selections for exhibitions, and awarding premiums. First, I do not think that it is always the largest fruit, or the largest quantity upon the plates that should receive the premiums. I know that it is often difficult to judge intelligently and justly; there are so many things to be taken into consideration, and there are often several exhibits very nearly equal in merit. There is, I think, a great deal of the fruit brought here for exhibition that is imperfect and unworthy, and should be thrown out of competition. Fruit entered for premiums should be the most perfect of its kind—free from blemishes—should have the stem on, and unbroken. It should have the characteristic form, size and color properly belonging to the variety. Preference should not be given to imperfect and over-grown specimens over those that are of natural size, especially if the latter are smooth and perfect and better represent the true character of the fruit.

N. Ohmer: Mr. Aldrich has made my speech. I think our State

Fair should adopt new methods. Fruits free from blemishes, or insect injuries, should be absolutely required, to enable it to compete for premiums. Mr. Ohmer spoke of the excellence of the fruits he had seen on exhibition at Boston at the meetings of the Massachusetts Horticultural, and American Pomological Societies, where only the most perfect specimens were admitted, and only the regular number displayed in the most attractive manner on square plates, and on tables where examinations and comparisons were easily made.

F. R. Palmer: Too many awarding committees take only size and beauty into consideration in awarding premiums on fruit at our county and State Fairs; and, indeed, many exhibitors fall into the same error in placing their fruit upon the tables. Two years ago, the Secretary of the Summit County Agricultural Society invited me to attend their Fair and award premiums upon fruit. The display of fruit was larger than I ever saw at a county fair, and all was shown in good order. One plate of Tulpehocken, large, uniform in size and color, perfect specimens of the variety, got the first premium card, while another plate by its side, very large, overgrown, rather coarse specimens, and not uniform in size or appearance, was passed over. The exhibitor of the larger sample was surprised to think that an apple could be too large to take the first premium. Another premium was offered for "the best ten varieties of apples." I think there were six entries, and all remarkably fine specimens of the varieties shown. I placed the first premium card on the entry comprising the smallest samples of apples, but all intelligently selected, standard, valuable varieties; while other entries contained large specimens of showy apples, such as King of Tompkins County, Cayuga Red Streak, Kaign's Spitzenburg, Tulpehocken, and other varieties which I did not regard as profitable, and adapted to the locality. One of the exhibitors, having a very handsome display of ten varieties (after the award was made), asked me why I gave the first premium to a collection not so large or so handsome as his. I told him that size and beauty were secondary considerations in selecting apples for a profitable orchard, and that several of the varieties in his collection, though large and showy, were of but little value to the orchardist. I learned afterwards that George W. Dean, of Northeastern Ohio, had made the entry upon which I placed first premium, and perhaps no man living is better prepared to make a selection of the best ten varieties of apples for Northeastern Ohio.

N. Ohmer: Mr. President, is it not the proper time, to-night, to decide upon the place for holding our next annual meeting; or is it intended to defer it to some future time?

President: It is the proper time for the decision of that question; we thought, however, that we would defer it until we had occupied all the

time we could afford in the general discussion. We will now proceed to consider the place for holding the annual meeting. It will be remembered that this meeting occurs the second week in December. We are now ready to receive invitations from any part of the State, where it is thought desirable to hold the meeting.

J. M. Westwater: At a meeting of the Columbus Horticultural Society here last month, a resolution was unanimously adopted, to invite the State Horticultural Society to make Columbus the place for holding the next annual meeting.

The President: We have an invitation, therefore, for the State Society to meet here, at Columbus.

B. F. Albaugh: As a member of the Miami Horticultural Society, I cordially invite the Society to meet with us at Troy, Miami county, at the annual meeting.

The President: Anything further in regard to place of meeting?

Theo. F. Longenecker: I will say that the Miami County Horticultural Society is not so very old an organization, but its progress is wonderful, and I think the Society should accept their invitation. They are very anxious to entertain the Society.

Several members of the Miami County Society expressed themselves in favor of holding the annual meeting at Troy, promising a large attendance, low hotel-rates, and good accommodations for holding its meeting. It would also be a benefit to their young Society, which was only about two years established.

The President: If there are no other invitations, and nothing further to be said with regard to the two places named, we will take a vote.

No other places being named, a rising vote of the members was taken, and Troy receiving a majority in its favor, it was announced by the President that the next annual meeting of the Ohio State Horticultural Society would be held at Troy, Miami county, Ohio, opening upon Wednesday, December 12th, 1889.

N. Ohmer said that he felt that the thanks of the State Society were due to the Columbus Horticultural Society, not only for the cordial invitation they had extended us at this time, but for the generous hospitality we had received at their hands on former occasions. The Columbus Society had never been wanting in their readiness to aid the State Society, in every practicable way, and he was sure all our members felt grateful for their assistance and timely attention.

The President: There are a few other items of business which should be attended to now. The committee appointed to express some words of sympathy on behalf of the Society, for the bereavement suffered by our worthy President, will now report.

The committee appointed to express sympathy for President Tryon, in his great sorrow, presented the following:

Resolved, That the members of the Ohio State Horticultural Society have heard with profound sadness, of the sudden death of the estimable wife of our worthy President, Hon. Hosmer G. Tryon, and we hereby extend to him our deep and heart-felt sympathy in this, his great bereavement.

N. H. ALBAUGH,
GEO. W. CAMPBELL,
Committee.

The resolution was adopted by a unanimous, rising vote, the Society standing in respectful silence.

The Secretary was directed to send a copy of the resolution to President Tryon.

President Lazenby: The next topic given us by the Business Committee is the Grape, past and present. What has been the experience of those present with the Empire State and Niagara? We would like to hear from our Secretary.

Secretary Campbell: The Empire State is certainly, in many respects, a remarkable white grape, and to my taste, it is the best in quality of the white varieties yet introduced. Perhaps more has been claimed for it than has been realized, as it is neither as early in ripening, nor as hardy in very severe winters as was at first represented. It is, however, a good bearer, and strong grower, with healthy foliage, with me, very free from mildew. Within my experience its only fault has been injury by very severe cold in winter, which, however, is easily remedied by pruning in autumn and laying the vines upon the ground with slight protection. The past two winters having been moderate, even unprotected vines have escaped injury.

The Niagara is also a strong grower and very productive. Clusters will average rather larger and heavier than those of the Empire State. It has strong and abundant foliage, but has shown some disposition to mildew in unfavorable seasons. In hardiness in winter, it has not been any better than the Empire State. It does not ripen as early as claimed at first—its season being about the same as Concord. Its quality is quite good when fully ripe; and it has proven a valuable and profitable grape wherever it can be successfully grown.

Moore's Diamond is a more recent introduction—also a white grape, and claimed by its introducers to be superior to all others. With me, it has not proven as productive, nor as large in bunch or berry as the Empire State or Niagara. It is, however, a strong grower, with apparently good foliage, and in hardiness against severe cold about the same as the two above named. It is a grape of good flavor, and not foxy. Not suf-

ficiently tested at Delaware to determine its character; but think it worthy of trial by all who are interested in new grapes. It is said to have done well in Western New York, where it originated, and where it has been in bearing for several years.

The Moyer is a new grape, which originated in Canada, and is recommended from there, as very early in ripening, and in quality and general appearance resembling the Delaware. The vine resembles the Delaware in foliage and general habit of growth, and is said to be less subject to mildew. It is probably a Delaware seedling, with no special improvement, unless it may be earlier ripening.

A new grape, originated by the late A. J. Caywood, of Marlboro, N. Y., which was first called Black Delaware, but had since been christened Nectar, is a good grower, with healthy foliage; the fruit handsome, bunches well formed, and medium large. Have not tested it sufficiently to recommend it, except for trial.

The Mills grape is also a black grape, of handsome appearance, which originated in Canada, and is said to have succeeded well in the neighborhood of Rochester, N. Y. A limited trial in Delaware has shown the foliage to be much inclined to mildew. It is probably a half-hardy hybrid, suited only to amateur culture in favorable situations.

The Eaton is a large, black, showy grape, claimed to be a Concord seedling. It is hardly equal to Concord in quality, but may be valuable for a market grape on account of its good appearance. Said to have originated in Massachusetts, and has received the recommendation of the Massachusetts Horticultural Society.

There is also a grape on exhibition called the Potter, recommended by Mr. Crawford, who can tell us something of its character.

Matthew Crawford: The Potter is a black grape, which originated in New Jersey. I have grown it several years with satisfaction. It has a smaller bunch than Concord; but the vine is a good grower and the foliage healthy in seasons when many other kinds are injured by mildew. The Worden and Niagara have both suffered some from mildew the past season. The Woodruff Red has been quite satisfactory with me, both in bearing, vigor and health of vine, and quality of fruit. Empire State has not been quite satisfactory. When ripening, the stems of a good many clusters appeared to dry up and the grapes on such bunches had not their proper flavor.

John Cunningham, of Hardin county, said the Empire State had not been satisfactory with him, but the Niagara had been simply immense, and those who had seen his Niagara vines in bearing, declared they had never seen such grapes before.

The Secretary said the drying up of the stem spoken of by Mr. Craw-

ford was a trouble to which all grapes were liable. Sometimes the main stem of the cluster, next the branch, was affected, and then the ripening of the whole bunch was arrested, and the grapes withered without coming to maturity. At other times only a portion of the cluster was attacked, and then the ripening of only that portion of the bunch was arrested, the remainder coming to maturity. Delawares, Catawbias, and others, were sometimes so affected.

N. Ohmer: I think our Society should not give its recommendation to so many white grapes. In our market, black or red grapes are preferred, and I believe them more profitable, and that the people like them better.

G. W. Trowbridge: I think with Mr. Ohmer; and so far as my observation goes, the taste of the people at large, gives preference to black or red grapes rather than green or white ones. The Niagara is probably the best of them for market—but even they did not sell well in Cincinnati last season.

The Secretary said it seemed to be a matter of locality as well as of taste, which color was preferred. In some places, black raspberries only would sell; in others the red were preferred and brought much higher prices. The demand for white, or black, or red grapes would eventually be settled by their relative quality as suited to the popular taste, without much reference to color. In the large city markets white grapes have had the preference. In Cleveland, the Pocklington is a prime favorite, as Mr. Kendall told me, in whose store I saw large quantities for sale in baskets. In New York the Niagara grape has sold for high prices, being taken for a foreign variety.

T. F. Longenecker had observed that birds seemed to like black grapes better than white ones, and that the white varieties had escaped their attacks where the black ones had been destroyed.

M. T. Thompson said there was good demand for white grapes in his section, and that they brought more money in the Cleveland market than black ones.

John Cunningham: Birds in my neighborhood have not yet learned to eat white grapes—evidently thinking they are not ripe, and so they escape attack.

W. C. Harris: Black grapes take the lead in the Toledo market, but people are not very discriminating. I often sell Perkins for Catawba, just because it is a red grape.

Inquiry was made as to the general success of the Fay currant. M. T. Thompson found it fairly satisfactory, of good size and appearance, and productive.

Geo. W. Trowbridge had been agreeably disappointed with the Fay. Had found it nearly all that had been claimed in size and productiveness,

but not better in quality than older varieties. Not quite as strong a grower as Red Dutch, but if well cultivated and cared for, thinks it will be generally satisfactory.

W. W. Farnsworth: I think nobody can tell what the Fay currant will do, anywhere, without trial. In some places, it is reported as doing well, but with me it is utterly worthless. The Victoria is the best of all on my grounds; from fourteen bushes I picked eighty quarts. Red Dutch is nearly as good. My soil is a black, sandy loam. I think the Fay requires a strong, clay loam.

John Cunningham had grown the Fay ever since they were first introduced, and after trying it a few years had discarded every other variety. Considers it superior to all others, and had grown clusters five and five and a quarter inches long.

A motion was then made to adjourn.

N. Ohmer: I see, Mr. President, there is another meeting on the programme for the 4th of October. I would ask if there is to be another meeting at that time.

W. W. Farnsworth: I suggest that the matter be left to the President and Secretary. If a meeting is to be held at that time, due notice can be given. I make a motion to that effect. The motion prevailed, and the meeting adjourned.

FINAL CENTENNIAL MEETING OF THE OHIO STATE HORTICULTURAL SOCIETY.

HALL OF THE HOUSE OF REPRESENTATIVES, }
THURSDAY EVENING, 8 O'CLOCK, *October 4, 1888.* }

The meeting was called to order at 8 o'clock, President Hosmer G. Tryon in the chair.

The President, after a few preliminary remarks, called upon Mr. W. W. Farnsworth, chairman of the Business Committee, to present such specimens of fruits as he had on hand for the consideration of the Society.

Mr. Farnsworth presented an apple which he received from Daniel Duer, of Holmes county, who represented this as the first year it had borne, and that it yielded a good crop. It is a sweet apple, and said to have sprung from a Tetofsky sucker. It is mellow now, and I think it about in season. It was brought to the grounds by Mr. Dresback, but he got it from Mr. Hall, and does not know much about it. It does not appear that the apple was regarded as possessing any special merit, and no action appears to have been taken upon it.

J. R. Hurst presented some apples which were sent by one of his neighbors, which he desired to have tested by the Society, and named, if found worthy. The two specimens sent were all he had remaining. It was supposed to be a seedling, and it was from a sprout dug up in the woods, in the neighborhood of Circleville.

L. B. Pierce moved that the specimens be given to Mr. Longenecker for examination, and such future action as was found desirable: which was so ordered.

Some further discussion was had upon this apple, and a member asked if it was known to be a new seedling. He thought they had the same variety in their county collection, but knew no name for it. He thought it was a very good apple.

J. R. Hurst said he considered it an excellent apple and worthy of a name.

It was finally ordered that the white apple presented by Mr. Hurst be referred to the committee for further examination, and if found, upon examination, new and worthy of introduction, to be recommended to the Society for a name.

The President called attention to a basket of very large and unripe grapes brought in by Mr. Uhler, of Franklin county, and requested Mr. Uhler to tell us what he knows about them.

Mr. Uhler said the grape was a seedling, raised by himself eight years ago. It is the strongest grower of anything he had. It was late in ripening, its season being about the middle of October. He would like to have the Society give the grape a name. It had fruited three years.

The President asked for remarks from the members upon the grape, and their opinion as to the propriety of naming it.

L. B. Pierce said if the grape could not be ripened here, better than the specimens exhibited, he did not consider it to have much value; but it should not be thrown away. It might be worthy of introduction, and would be likely to ripen and might have value further south, or in other more favorable localities. He suggested that the Society simply recommend it for further trial; and as this seemed to be approved, no further action was taken.

President Tryon: The next subject in order is, the best methods of placing fruits for making the most instructive and attractive displays at our exhibitions. We would like to have the opinion of members on this subject, and hope they will not be backward.

S. R. Moore: We have, within the past few days, had some experience on this question. I do not think, if I were going into another such display, I should use anything but pure white, porcelain plates, upon tables slightly raised from the front, and covered with white paper. I

would not use colored plates, and the manner in which the Clarke, Lake and Ottawa counties have arranged their exhibits make a good show, but the bright colors distract the view, and, to some extent, spoil the effect.

Mr. Housekeeper: If I were going to prepare exhibition tables again, I would not have the fruit raised more than eighteen inches high at the front. I think the lower you can get it, the better it shows.

W. S. Devol: I think the gentleman is right about getting the exhibits lower. In looking down, it is better, in my opinion, both for display and for the identification of the fruit. If we have to look up, we do not get the full view of the fruit, and cannot give it as close examination.

Thos. F. Longenecker: Our tables stand rather high, and we found that the fruits upon many of the other tables would have shown to much better advantage if it had been lower. I understand the Michigan Horticultural Society, and perhaps some others, use only flat tables for their exhibits, and of such width that the fruit can be reached, and examined from either side.

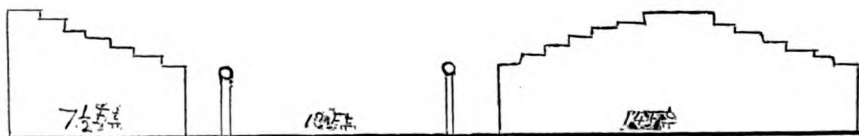
F. R. Palmer: One thing I have noticed in the Horticultural exhibits of our own Society is, that the duplicating of too many varieties simply for display, impairs the usefulness of the exhibits. The exhibits should conform to the requirements of the premium lists. Just the number of plates and varieties named should be allowed, and no more.

L. B. Pierce, of Summit county, said that in large displays it was a matter of great importance that the most showy and effective means of bringing out the beauties of fruit be adopted. Fruit, beautiful in itself, and properly exposed to view, needed nothing but the simplest arrangement. In making the awards during the afternoon, he had been especially impressed with the advantage which some counties had in their modes of display. The tables at the front were low (about two feet), and rose in jogs of about two inches, each shelf being the width of a plate, until ten shelves were afforded; then a two-foot passage-way, and then five more shelves, extending back to the wall, in the same general inclination of the others. This gave a total height to the back shelf of 54 inches, or several inches lower than the level vision of all but children. One county at least (that of Ross), suffered from having their plates on a stand that at its highest point was seven or eight feet high. The fruit near the floor was all right, but as the eye of the spectator followed the exhibit to the top, the fruit gradually disappeared, and the bottoms of plates formed the chief feature. The fact that the shelves formed a beautiful compound scallop, and were nicely trimmed with bright tissue paper, did not help fruit that was above the level of the eye. In a large exhibit, comprising so many counties, the want of uniformity in modes of display destroyed

the general effect, and if the management had insisted on all tables being built on the plan described, the general effect would have been magnificent.

President Tryon protested against the use of flat tables; and showed a drawing, made by Mr. Longenecker, after the style used by the Lake county exhibitors. This plan, which had been used so successfully by the exhibitors of Lake, Clarke, and Ottawa counties, had been devised in Lake county, and after having had considerable experience with it, he did not think it could be materially improved. He hoped county societies generally would adopt it. In its use, if you have half a dozen varieties, you put them up and down the shelves; if you have twelve, put them across the shelves in two rows, and not lengthwise, placing them in direct line. Arrange in the same way exhibits of three, six, twelve and twenty-four varieties of grapes, peaches, apples, pears, etc. In this way, such exhibits can be placed next to competing ones, rendering examination and comparison easy; and the effect is also pleasant and attractive. Next in importance, I consider the making of a permanent list of the exhibits, which should be in alphabetical order; and each exhibit so placed in exact correspondence with the list, that it can be found at a moment's notice.

[The following illustration, taken from a drawing made by Mr. L. B. Pierce, gives the form of tables in sectional view, recommended by President Tryon. The larger table used for the center of the hall, and the smaller the side-tables on either side, next to the walls, with walks between. For county societies, or small halls, tables like the smaller one, against the side walls could be used. The illustration is adapted to a large hall, 55 feet wide with two walks, each 13 feet wide between the tables, with guard-rails two feet from the tables all around, leaving the walks 9 feet clear.]



H. G. TRYON'S PLAN FOR FRUIT EXHIBITION TABLES.

W. W. Farnsworth said he thought the suggestion of placing fruits in regular order, as suggested by the President, a very important one. He had never been able to satisfy himself as to the best methods of exhibiting fruit. We have premiums offered for the best six varieties of showy apples in a basket. The premium is not offered to a fancy basket, but for size, beauty and excellence of the fruit, and it seems to me that

the effect would be greater if in the exhibit all kinds of fruit were allowed. He also would not allow flowers to come in, unless, perhaps, a plant or so, but allow the use of all kinds of fruits. Thinks the effect would be finer. He also referred to the methods of labeling fruit. He did not like wire standards, or large placards, as both detracted from the exhibit, but favored small printed labels, gummed to one specimen on each plate. The worst that could be urged against this method was, that the label sometimes conveniently hid a blemish.

S. R. Moore: There is one objection to the use of flowers;—the watering of them. We tried a little of that, and found it took an extra amount of labor. It is necessary, in order to keep life and vigor in the plants, to water them daily. I would suggest that there be a committee appointed to label such fruits as were without labels on exhibition, and to correct such as were incorrectly named. There are a great many fruits upon the tables without names.

L. B. Pierce. I think the case suggested by Mr. Moore will be reached by the one having the fruit in charge. There are a great many fruits put upon the tables wrongly labeled. Many exhibitors can set the exhibits to rights, and I think every one should make it his business when he sees a fruit wrongly labeled, to have it righted. An incorrect label is sometimes very misleading to those not acquainted with fruits, and who desire to know the proper names of fruits, and perhaps have visited the Exposition especially to learn the name of some variety they have. Two things should be insisted upon at every fruit-show for premiums: First, that fruit should be correctly named; and second, that in exhibits for a certain number of plates, there should be no duplicates, and only the exact number called for.

W. W. Farnsworth. I now move that the plan proposed by President H. G. Tryon be recommended by the Society, and adopted as the best method for the display of fruits at our exhibitions. The motion was carried unanimously.

Mr. President: If there is nothing further upon this topic, the next subject in order is the Peach.

J. R. Hurst, of Ross county, said peach-growing had ceased to be profitable in southern Ohio. It was usually a long time between crops; and when there was a crop prices were apt to be low. Commission men gobbled up the profits. Columbus commission dealers would return from 30 to 60 cents per bushel, when the best peaches were bringing from \$1.75 to \$2.00.

President Tryon then read the following valuable paper which he had prepared on this subject:

PEACH CULTURE.

BY PRESIDENT HOSMER G. TRYON.

The question as to the causes which have made peach-growing unprofitable almost all over the State of Ohio, is one rarely looked into, yet one of real importance to all our people. If the causes can be overcome by means which we may employ without too great cost, then there is every reason why we should find them out and put them in practice. It is poor policy to buy of other states or other countries that which we can, and ought to produce for ourselves, especially a luscious and healthful fruit like the peach, so much enjoyed by every one when they have it, and so much missed when it cannot be obtained. It is proper that this Society give time to inquiring into the causes which have ruined our orchards, and to discover, if we can, the means by which they may be met and the disastrous results avoided.

As it appears to me, the first cause of decline on clay lands, is deterioration of soil and increased exposure to extremes by the clearing away of timber. Peach trees used to flourish on virgin soil almost everywhere in Ohio, on clay as well as on sandy lands. As the forests were cleared, orchards were more exposed to raking winds and greater extremes of temperature, destroying the crop by frost in the spring, or killing the trees outright by cold in winter.

Deterioration of soil, however, has doubtless more to do with the failure of peach orchards to flourish, than change of climate. This, I think, is fully demonstrated by the fact that where other causes have not arisen to prevent, the trees still continue to flourish on sand or gravel, or on well-drained, sandy loam soils. In the virgin state, our clay lands were well supplied with an abundance of vegetable mold, and produced the very best crops of wheat, corn, and vegetables; and peach trees flourished in the light, rich mold, and produced as abundantly as on other soils.

When the vegetable mold had gone to decay and was consumed by the removal of crops, then peach trees ceased to flourish, and the growing of peaches for commercial purposes ceased to be practicable, the same as wheat, corn or potato-growing became impractical on such soil, except by the most careful preparation. It is true that young peach orchards still flourish luxuriantly on well-prepared clay soil, but the trees soon go into decline, and the orchards, even in favorable localities, fail to be remunerative. My observation leads me to the inevitable conclusion that a peach orchard, to flourish and produce good, merchantable fruit, must be kept in thorough tillage; hence must be planted on dry, friable soil, where the roots will penetrate below the action of frost, or what is quite as important, below danger of serious damage by plow or cultivator.

~~When~~ Peach trees do not have roots to spare by breakage or mutilation, and where the soil is heavy, tillage must be abandoned when the trees get growth, which soon proves fatal to the orchard, for if tillage is continued, mutilation of the roots is almost inevitable, and destruction follows. Frost aids in the work, by bringing the main roots, annually, nearer the surface. I have never known a peach orchard to flourish any paying length of time, on a straight, clay soil. I do not mean to have it understood that it is useless to attempt to grow peaches on clay, because there are ways of doing it; but I would not advise making the attempt for commercial purposes. I would, however, advise every farmer so situated, to use his best endeavor to grow a family supply of this most luscious of all fruits by underdraining, supplying sand or gravel and vegetable mold for a reasonable number of trees, so arranged as to make them an ornament to the premises; if necessary, planting a few trees annually, and removing annually such as become unproductive or unsightly.

The change wrought in temperature, can only be met by judicious selection of location, guided by intelligent observation of the facts which render some locations subject to extreme low temperature in winter, or killing frosts in spring. I think statistics will show, that peaches are raised more or less in every county in the State, showing that there are some locations in all counties, if not in almost every township, not always subject to

destruction from change of conditions in temperature, though this is no doubt a marked cause of deterioration or decline in production everywhere, and fatal in certain localities all over the State.

The increase of insects is worthy of mention in this connection, as another cause of decline.

The destruction of young trees by the peach-tree borer has become so prevalent that in some sections it is very difficult, to say the least, to grow an orchard up to bearing age, and keep more than one-half the trees in line.

But the one thing, in my humble opinion, which has done more to wipe out the peach-orchards in this State, and has in many of the best localities apparently made profitable peach-growing a thing of the past, is that destructive disease which some itinerant or community, having no particular regard for delicacy or beauty in their use of the king's English, named the "yellows." But whether the name is delicate or indelicate, appropriate or inappropriate, the fact remains, that it is a disease which comes like a thief in the night, and is no respecter of trees, whether thrifty or unthrifty, on soils rich or poor, new or old; whether fertilized or not, the destruction proceeds insidiously but surely, day by day, month by month and year by year, without cessation, and though it may have been known fifty, seventy-five, or even a hundred years, nothing has yet been discovered, or if discovered, never generally applied, to stay its ravages.

I believe it is far more general than people are willing to admit, and far more destructive than it is generally supposed to be. It is a fortunate circumstance that trees affected with yellows are easily detected, by their spindling, sickly appearance.

L. B. Pierce, of Summit county, said he thought there was money in peach-growing, if you had a local market. He sold Early Alexander for \$3.60, and Early Crawford and Yellow Rareripec brought \$2.50. Had sold no good peaches under \$1.50 per bushel. The causes of failure in shipping were, usually, either inferior fruit, or poor condition. As a rule, a good article, in good order would pay a profit.

President Tryon. The subject of strawberry-growing is next in order, and we would like to hear from some one upon the newer varieties.

W. W. Farnsworth: We have experimented somewhat with the new varieties, Bubach and Jessie, but I would rather hear reports from others. The principal varieties which we have grown besides these, are Wilson, Crescent, Cumberland and Charles Downing. With me, the Wilson has usually proved nearly worthless, and it seems strange, for one of my nearest neighbors has grown strawberries perhaps 15 years, and about the finest berries he grew were the Wilson. He has raised at the rate of 150 bushels to the acre. The Crescent is our great berry; the most profitable, though not as good as we would like. The Charles Downing is very good. The Cumberland is also good, but not a very profitable berry.

T. F. Longenecker named Jessie, Bubach, Haverland, Summit, Sucker State, Warfield's No 2 and Logan, as among the most promising of the newer varieties; and of Crescent and Wilson, as still the most popular and generally profitable of the old sorts.

Mr. Kramer spoke favorably of the Sharpless, also of Crescent, Charles

Downing, Sucker State, Jessie and Green Prolific, and of a seedling from Crescent.

W. J. Green, of the Ohio Experiment Station, named Jessie, Bubach, Haverland, Warfield's No. 2—the seedling spoken of by Mr. Kramer—Pearl, and Crawford—the latter not in market—as promising among the new varieties, and Crescent, Charles Downing and Wilson as still among the best old ones.

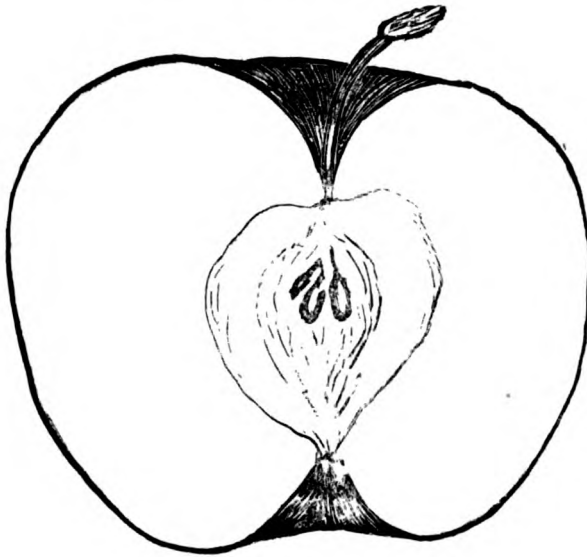
Some discussion was had upon the most profitable berry for market and most productive for general use; and the majority of the speakers still favored the Crescent, with Wilson to be used as a fertilizer. Sucker State was also recommended as profitable to be used as a fertilizer.

Mr. Green said the Crescent was sometimes self-fertilizing.

The influence of bees upon the strawberry-crop was also discussed, and the opinion prevailed that their agency in carrying and distributing the pollen among pistillate varieties was very beneficial to the strawberry, and probably to other berries and fruits generally.

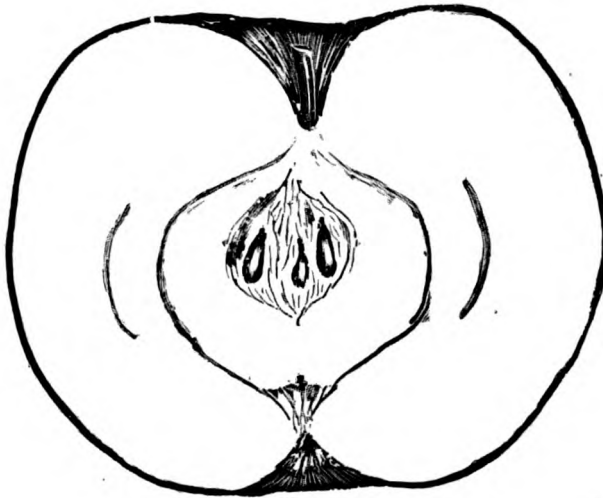
Some discussion was also had upon the most profitable cherries to be recommended for general use, and Early Richmond, Dyehouse and Montmorenci were favorably spoken of by Messrs. Longenecker, Farnsworth and J. P. Streeper.

A motion was made to adjourn, which carried.



SHACKLEFORD.

Sent from Missouri for exhibition, to the annual meeting of the State Horticultural Society, at Troy, Ohio, December, 1888. Claimed to be a seedling from Ben Davis. Evidently an excellent long-keeper, and of fine texture and better flavor; core rather small; flesh white, and fine-grained, mild, sub-acid flavor; color not as bright as the Ben Davis in the specimens exhibited, but very handsomely striped and splashed with bright crimson and vermillion, on a yellowish, orangeground. A handsome and attractive apple, of good, but not high flavor. The apple has the character of a popular market variety—and would be valuable if the tree is hardy, healthy and productive.



WINTER MAIDEN'S BLUSH.

Exhibited at several meetings of the Ohio State Horticultural Society, by E. Buechly, of Greenville, Darke county, Ohio, December 1888; claimed to be a seedling from the Maiden's Blush. As shown in the cut, this apple is uniform, very regular, roundish, a little flattened; the basin is small, shallow, finely furrowed; calyx small, partially closed; cavity medium wide, and deep, smooth and regular, not russeted; skin smooth, slightly sprinkled with a few very small, brown dots; waxy, bright yellow, shaded on one side with delicate crimson blush; flesh, white, crisp, medium fine-grained; flavor mild, pleasant, sub-acid; much like the old well-known autumn Maiden's Blush. Quality good. Season apparently December to January. A very beautiful apple.

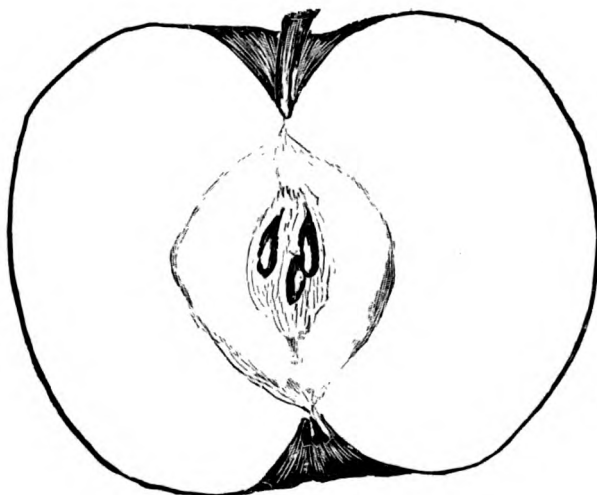
The Secretary dissents from the opinion of the fruit committee, that this apple nearly resembles the Winter Maiden's Blush, of Pennsylvania, as described by Charles Downing, on page 413, of *Fruits and Fruit Trees of America*, which is given as follows, and by comparison of the two, it will be seen that they cannot be the same variety :

WINTER MAIDEN'S BLUSH,

From Bucks County, Pennsylvania.

"Form, oblong, conic, yellow, covered with large, distinct, carmine dots; stem short, calyx closed; flesh white, crisp, tender, sub-acid, very good; core large."

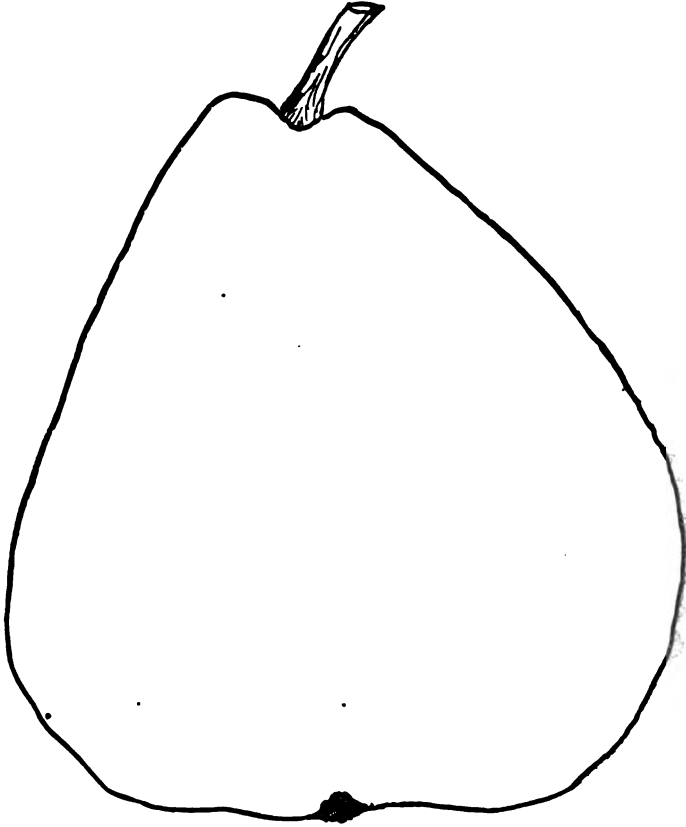
JOHN W. B. YOUTSEY'S APPLE.



Exhibited at the Annual Meeting of the Ohio State Horticultural Society, at Troy, Ohio, December, 1888.

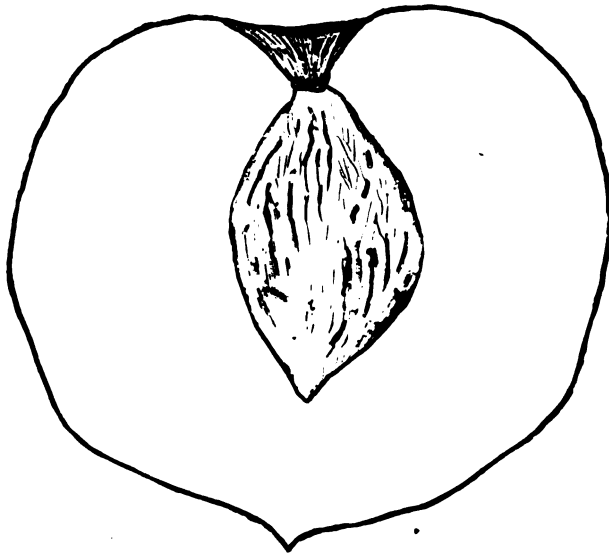
Fruit medium large, roundish, sometimes a little uneven, or one-sided, slightly oblate, basin shallow, uneven, slightly corrugated; eye closed; cavity narrow, uneven, a little wavy, medium deep, and russeted; stem medium; color light green, yellowish on one side, and faintly striped with dull, light-red brown, skin thin, smooth, rather sparsely sprinkled with small, brown dots; core and seeds small; flesh fine-grained, white, tender, juicy; flavor mild, pleasant, rich sub-acid; quality very good. Season, apparently, December to January.

DUCHESS D'HIVER,



Or WINTER DUCHESS Pear, exhibited at the Annual Meeting of the Ohio State Horticultural Society, December, 1888.

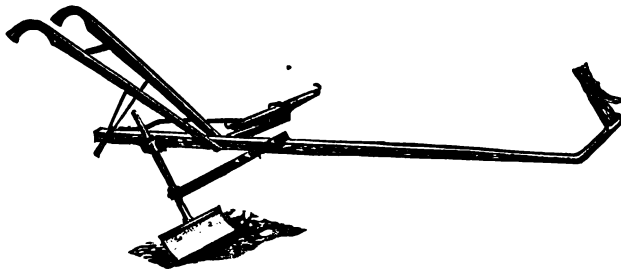
A large, late-keeping, showy pear, in quality somewhat like the *Duchesse d'Angouleme*; perhaps hardly as good. Rather coarse-grained, principally valuable for large size, and late-keeping.



DIAMOND.

Exhibited at Centennial Meeting on the State Fair Grounds, September 20, 1888, by Mr. F. G. Withoft, of Dayton, Ohio.

A new seedling peach of the largest size, being three and one-eighth inches in diameter, and weighing nine and one-half ounces. Color of skin, rich, golden yellow, with minute crimson dots thickly covering the surface; on sunny side, handsome dark red with lighter shades of bright red and orange—very beautiful. Flesh, light, orange yellow, slightly red next the stone; very juicy, fine-grained for so large a peach; flavor pure, sweet, and rich, without bitterness; clings moderately. Apparently, one of the best and most attractive of the yellow clings.

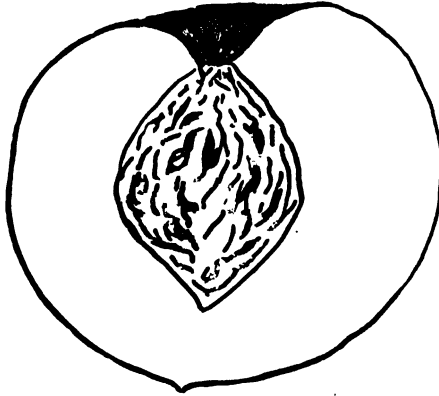


E. H. CUSHMAN'S HORSE-HOE.

This hoe has been perfected by several of the Euclid vineyardists within the last three years. It is not patented, and is manufactured by the two local blacksmiths for \$5.50 per hoe. The pole is of wood, 2x4 inches, 10 feet long, tapering to 2 inches, and rounded at the end with a $\frac{1}{2}$ -inch round piece of iron 12 inches long, with a loop in it for strapping to the collar of the horse. An inch round piece of iron, 2 feet long, is bolted and held to the pole by a casting; and to the lower end of this is bolted the steel blade 5 by 16 inches, which acts as a scraper or hoe; this blade is slightly concave. A flat iron brace, 21 inches long, with holes above regulates the angle of the hoe.

A piece of wood 15 inches long, is morticed into pole, on which whiffletree works, held by an iron brace 26 inches long. Handles are $4\frac{1}{2}$ feet long, which can be raised or lowered by sliding the braces which hold them up. The hoe is held to the pole by a casting, which is bolted on the side. Can be had at Cleveland.

By using a steady, slow-walking horse, and passing down on the left hand side of a grape-row and back on the opposite side, nearly all of the top soil underneath the row can be moved, leaving but little for the hand-hoe to do. This tool has saved many a dollar for the vineyardists, and has been the means of keeping in check the millions of weeds with which he has to deal.



MARTIN A. RANCK'S PEACH.

The above is an outline of a handsome and excellent peach sent the Secretary, August 22, 1889, by the originator, who says: "It is a seedling from the Early Crawford, which came up in his garden three years ago. Last year it bore one fine peach—this year, three pecks. It is a fine, thrifty tree, ten or twelve feet high, and in perfect health. The fruit ripens from the middle to the last of August."

The peach is of medium size, roundish, slightly oblate; suture very slight, point at the top very small; flesh nearly white, fine-grained, slightly red next the stone; moderately firm, juicy, rich, and high-flavored, in quality, best. Skin light, creamy yellow, splashed and shaded on the sunny side with deep crimson. Stone rather broad, but thin. Free stone. There is very little resemblance in any way, to the Early Crawford, except the redness next the stone; and it is a peach of higher character, and better flavor than its reputed parent.

G. W. C.

TWENTY-SECOND ANNUAL MEETING
OF THE
OHIO STATE HORTICULTURAL SOCIETY.

TROY, MIAMI CO., OHIO, }
WEDNESDAY FORENOON, *December 12, 1888.* }

The twenty-second Annual Meeting of the Ohio State Horticultural Society was held in the Public Hall at the new Court-house of the pleasant town of Troy, the county seat of Miami county, by invitation from the Miami County Horticultural Society. The assembled members found the arrangements for the meeting most satisfactory; a large, well-lighted and comfortable hall, with exhibition room adjoining, left nothing to be desired for their accommodation. As usual, the forenoon was principally occupied in arranging the fruits upon the exhibition tables, and in friendly greetings and intercourse, and in preparation for the coming sessions of the Society. The following were the principal exhibitors: Messrs. Hurst & Hurst, of Chillicothe, Ross county; Isaac Freeman, of New Carlisle, Clarke county; J. Peirce, of Troy, Miami county; E. H. Cushman, of Euclid, Cuyahoga county; E. M. Buechly, of Greenville, Darke county; John W. B. Youtsey, of Troy, Miami county; J. H. Britton, of Painesville, Lake county, and Silas Carlton, of Pomeroy, Meigs county. The principal exhibits were of apples; but there were also pears, grapes, and some interesting new varieties, a report upon which, by the fruit committee, will be found on the following pages.

Much credit is due these exhibitors for their liberality and disinterestedness in making an exhibition so creditable and instructive, in a season when no premiums, were offered by the Society.

WEDNESDAY AFTERNOON, *December 12, 1888.*

The meeting was called to order at two o'clock, by the President, H. G. Tryon, who addressed the meeting as follows:

The usual custom has been to announce the names of committees at

the opening of the meeting. The first in order is the Committee on the Order of Business.

The Chair will appoint Theodore F. Longenecker, of Dayton, Montgomery county; F. R. Palmer, of Mansfield, Richland, county; E. H. Cushman, of Euclid, Cuyahoga county, as that committee. The other committees will be made up as needed. The first thing in order will be reports from members of the Ad Interim Committee. Mr. Green, of the Ohio Experiment Station, is the first to report.

Mr. Green read his ad interim report as follows:

AD INTERIM REPORT FROM FRANKLIN COUNTY.

BY W. J. GREEN.

The strawberry crop was very light, and was harvested in about one-half the usual time. The dry weather in 1887 checked the growth very materially, but the drouth that occurred this season, during the time the fruit was ripening, was still more disastrous to the crop. Good prices were realized, but the crop was far from being a paying one.

At the Experiment Station, an attempt was made to irrigate a bed of about half an acre, taking the supply from the city water works. The quantity at our disposal was about 600 gallons per hour, which was found to be insufficient for the purpose. The rows were only twelve rods in length, but the water would hardly get across the field in half a day. The water was not turned on until the ground had become very dry, and the crop had begun to fail; but even had the work been commenced in season, the quantity of water was insufficient. To wet the ground thoroughly, not less than an inch and one-fourth of water was required, or 1,000 barrels per acre, evenly distributed over the field. This could not be done by running the water on at the upper end of the rows, and to run it over the field where and when needed required considerable attention. It was too much like watering with a cart or sprinkling pot. It was not thought to be advisable to spend the time watering the bed with a hose, until the ground became so parched that it took in our stream of water of 600 gallons per hour as a huge sponge would; and then we found it possible to water only a few rows, and not the full length of these. This experience has a practical bearing upon the question of irrigation, and to more fully profit by it let us consider what it means to irrigate an acre of land.

About one and one-fourth of an inch of rain-fall is sufficient, except in a very dry time, to soak the soil quite thoroughly. This is equivalent to about 1,000 barrels of water per acre. At the rate that the city charges for water, the cost would be nearly \$7.00 per acre, for one application. Whether one could set up a pump and furnish his own supply cheaper, is uncertain. A wind-mill would hardly be adequate for any considerable area, without a large reservoir, which would be subject to constant loss by evaporation. If horse-power is contemplated to furnish a supply, it needs but to be considered that a quantity equal to one good, soaking rain, would require 200 horses to move it; that is, it would make 100 two-horse loads. Since we do not find it advisable to plant strawberries on low land, it is out of the question, in most localities, to irrigate by means of ditches. The only feasible plan that has been tried, by which to secure water sufficient for the strawberry crop is by mulching, and everyone knows that this plan often fails. If cultivation is practicable during fruiting time, it may answer the purpose better than anything else. It surely is the best plan of all for such crops as can be cultivated during the entire season.

Experiments made in Illinois and Connecticut, show that the equivalent of one-half an inch of rain fall can be saved, or prevented from leaving the soil by evaporation, within a period of two weeks, simply by stirring the surface frequently. This means at the rate of 400 barrels per acre. A man and horse can cultivate $2\frac{1}{2}$ acres in a day. If he goes over this every other day he can save 1,000 barrels of water from evaporation by eight days' labor. That is, he can do with one horse and a cultivator five times the amount of good in saving water, that he could do with a horse and cart by hauling. This is on the assumption that he could conveniently get the water to haul, which is out of the question in most cases. If we can, by thorough cultivation, save the equivalent of an inch of rainfall in a month, we have little to fear from drouth, except in the cases of a few crops. The drouth would have done serious damage to our raspberry crop, had we not practiced thorough cultivation.

This plan of irrigating with the cultivator is now too well known to need such comments as these, were it not for the fact that in practice it is still almost as rare as irrigating with water.

The dry weather gave an opportunity to compare varieties as to their ability to endure drouth. A fair comparison cannot be made, however, between early and late varieties, as the former had yielded a portion of their crop before the drouth was severely felt, while the latter were without sufficient moisture from the beginning.

Of the early and medium varieties the Warfield, Monmouth, Covell and May King seemed to suffer most, while Crescent, Bubach, Haverland, Jewell, Jessie, Lida, Miner's Prolific, Pearl and Crawford withstood the drouth with but little injury, until the two last pickings. The Warfield made a good growth in 1887, in spite of the dry weather, but with the additional strain of a crop of fruit, failed after the second picking, and substantially the same was true of the Covell. Monmouth was deficient in vigor at all times. Jessie and Bubach held out about as well as the Crescent. Lida, Crawford and Jewell were somewhat anomalous in making a poor growth in 1887, and yet maturing a fair crop in 1888. Haverland was fruited on fall-set plants only, hence no fair comparison can be made; but it is able to endure hard usage equal to any of the others. Pearl is another of the same class. Of the medium and late sorts, Gandy stood the test the best of any, while Carmichael failed completely. Ohio gave only two pickings. The Jessie and Bubach have now been on trial long enough to warrant the assertion that they are safe varieties to plant. Jewell and Gold have both shown the same weakness for high living. Bomba, Louise, Monmouth and Carmichael refuse to make a respectable growth with us, nor do they appear to be fruitful. Lida and Crawford do not grow as well as we would like, but they are quite fruitful, while the berries of both are large and beautiful. Itasca, Logan, Sunapee and Mammoth ought to be returned, C. O. D., from whence they came. The most promising of the untried, or not fully tested sorts, are Gandy, Pearl, and Haverland.

RASPBERRIES.—There is but little new to be said concerning raspberries. The Ada, which is now before the public, has shown but one weakness, viz.: a liability to blight, but as this disease seems to be quite local, there need be no apprehension on that score. It is much like the Gregg, and is thought to be hardier, but we have had no opportunity to test that matter. It seems to be more productive, but that point needs further confirmation. It must be classed as promising and worthy of trial.

Palmer's Seedling is another new claimant for public favor, and the claims made in the circulars sent out are quite within the bounds of truth and reason. Some will say that it is the same as Tyler and Souhegan, which will not be very far from the truth; but far enough to miss the mark, by several points. It is more productive, and the berries larger and of better quality than Tyler. Such small differences are not mere trifles to fruit growers. It is a good thing to have an old variety rejuvenated, as you know to start with, what you have. The Palmer seems to be a very respectable improvement upon the Tyler, and that is enough to say at present. The testimony concerning the other varieties on the list is substantially the same as has been given in the past, and there is nothing new to offer.

BLACKBERRIES.--There are probably not more than two or three blackberry plantations in the county, and for the simple reason that we have no hardy sorts that much excel the wild varieties in size. The Erie, and Minnewaski are large enough, but not quite hardy enough to withstand our variable and severe winters. They may stand in some sections of the State, but not in the central. The Snyder, Taylor, Ancient Briton, Agawam, and Early Harvest, all stand quite well, but in market they would be classed with wild berries, and sell for not more than five cents per quart; hence there is no encouragement for fruit-growers to plant them.

No good reason is known, why the Lucretia Dewberry might not be grown with profit, but no one has planted it for market. Outside the fruits named, but little is done in the county in fruit-growing, in a commercial way.

A few good apple-orchards are found, that prove profitable; but most of the old orchards are sadly neglected, and very few new ones have been planted. The crop was good the past season, and less wormy than usual; but, so far as known, there is no increase of interest in apple-culture.

There were also good crops of pears, plums and cherries. The Wild-Goose plum-trees on the Station grounds bore a crop for the first time, although old enough to fruit several years ago. The reason assigned for their unfruitfulness in former seasons, was that no varieties that bloomed at the same time were growing near. No new trees have been planted that are old enough to bloom, and yet the trees were loaded with fruit. It was thought that all varieties bloomed at more nearly the same time than usual, but as no record was kept, this cannot be assigned as a reason for fruitfulness, beyond a doubt.

The vegetable gardens about Columbus are more fortunate than those of most other localities, in being able to secure manure for the cost of hauling, and some of those living near the city often have a load dumped on their premises for nothing. This is owing to the fact, that an ordinance requires that no manure be allowed to accumulate in the city. Considerable gardening is carried on, but large quantities of vegetables are shipped to the city. These shipments are doubtless made because commission-men solicit consignments. That they do solicit, there can be no doubt, and often when the market is full, and sales cannot be profitably made. Our commission-men are probably no worse than those of other cities, and soliciting consignments is perfectly legitimate; but the fact that it is often done to break down the local market, and thus discourage and disgust the local producers, is notorious. A prominent commission-man came to me and solicited consignments, saying that if he could get all the home-grown berries he wanted, he would handle no others. He secured the crops from a few local growers, and at the same time, as many as he could from Barnesville. How the Barnesville growers fared, is not known; but the Columbus parties found a wide difference between the price he obtained for them, and what they might have secured by selling their own fruit. He consoled one of the growers by assuring him that his berries brought him one hundred dollars per acre, and that ought to satisfy any reasonable man! In one way, the commission-men discriminate in favor of home-growers, viz.: they loan them crates. A Columbus grower needs no crates of his own, as he can market his entire crop in Barnesville and Cincinnati crates without paying a penny for rent of the same. It is possible that his berries are sold as Barnesville berries, as hucksters are never known to sell any other kind. The profit arising from working on Barnesville's reputation, does not go into the pocket of the local grower, for his share comes in shape of free crate-rent.

It is a fact that Barnesville growers do not get as much as they ought, for berries shipped to Columbus. If commission-men can each afford to send an agent to Barnesville to solicit consignments, why cannot the growers there afford to send an equal number of men to the city to sell their berries? They could get better prices and keep the growers correctly informed as to values. The grape-growers of the north, could do the same thing to good advantage.

Columbus requires large quantities of fruit and vegetables aside from what home-growers produce, but it is to be feared that the commission-men and army of hucksters

absorb more than their share of the profits, and the people are not half served at that. This is a point that might be enlarged upon to any extent. People who would buy good fruit if it could be had, often go without. They object to having good berries thrown out of clean baskets to be shoveled up by dirty hucksters, both on account of the shrinkage and the filth.

Fair to good berries sell in our market every year, at retail, for double the price that the Barnesville growers receive for theirs, and for the simple reason that some of our growers sell their own berries. If fruit could be properly handled when it reaches market, the prices realized would not only be higher, but the quantities consumed would be greater. There are at least two sections in the State producing three kinds of fruit, that might dictate their own terms for the fruit sent to Columbus. They could not exact exorbitant prices, but could at least secure a fair measure of justice toward themselves. Barnesville growers could say to Columbus dealers, "You can have our strawberries and raspberries at the market prices in Columbus, and you need not be to the expense of sending men here to solicit our berries, as we will sell you what you want from day to day, and keep ourselves informed as to prices at our own expense." This would put matters on a business basis, and could be done, as we must have Barnesville berries. The Lake Shore region could do the same with their grapes, and commission-men would come to terms, as they could not help themselves. This plan would not work in all markets; but for the fruits named, it is entirely feasible in Columbus.

There is no more reason why fruits should be sold on commission, than that any other staple commodity should be put into the hands of those who will return what they please to the producer, and pocket the balance.

President Tryon: Mr. Green has touched upon two points of great importance to every grower of fruits and vegetables, which are not on the programme. I would ask Mr. Green, if he has made any experiments as to the depth the soil should be stirred to produce the best results in retaining moisture; and also as to the comparative value of mulching, for the same purpose?

W. J. Green: We have made no comparative experiments but I think that the depth to which the soil is stirred, is of less importance than frequency of stirring, and that stirring of the soil answers the same purpose as mulching. The loose surface soil answers as a mulch.

President Tryon: Is it condensation of moisture, or the prevention of evaporation that is produced by mulching?

W. J. Green: I should say that it is prevention of evaporation rather than condensation. In the experiments referred to, the plan was to fill vessels with soil and weigh frequently to determine the relative loss in evaporation between the soil that was stirred and that which was left untouched. The vessels were closed at the bottom so as to prevent the water rising from the soil below. There was some evaporation from all of the vessels, but less from those where the soil was stirred, than from those where it was not.

President Tryon: Is it necessary, or beneficial during dry weather, to stir the ground as often as once in every two or three days?

Mr. Green: I should say yes, or as often as once a week.

F. R. Palmer: I do not think it should remain for a week without stirring, especially after rain had formed a crust. Stirring the soil loosens it up, and attracts moisture toward the surface.

President Tryon: The crust formed after rain, in summer, should always be broken, and the surface made fine as soon as the ground is dry enough.

N. Ohmer: Is satisfied, from his experience, that frequent cultivation and keeping the surface of the soil finely pulverized acts as a mulch; and he has by this means, overcome the effects of severe and protracted drouth and produced good and profitable crops of large berries, while others in his neighborhood who neglected frequent cultivation had complete failures.

T. F. Longenecker: Thinks character of the soil has something to do with it, there being much difference between a clay and sandy soil. He had found great benefit, however, during very dry, hot weather, from keeping the ground frequently cultivated and fine, the moisture remaining for weeks, within an inch or two of the surface.

Mr. Simmons: Has cultivated his blackberries once a week, and found them to do well. Often examined them, and found the ground moist quite near the surface; they gave a fine yield, and as fine berries as he ever saw. He experimented with two adjoining rows, mulching one, and cultivating the other. The yield from the two rows was 22 and 23 quarts, respectively; and he could see no difference from the mulching.

President: The next thing in order is the report of Mr. J. R. Hurst, of Chillicothe. As he is not present, we will have the report of Mr. E. H. Cushman, of Euclid.

AD INTERIM REPORT FOR CUYAHOGA COUNTY.

BY E. H. CUSHMAN, OF EUCLID.

The Horticultural year of 1888 has been the busiest one within the memory of our Horticulturists. This, no doubt, was owing to the efforts of Nature and Man to celebrate our Centennial.

Never before in our history, have there been such enormous quantities of fruits and vegetables as we have had during the season just closing. More labor has been required to keep the soil in proper condition, owing to the frequent rains and the rapid and persistent vegetation of weeds.

Strawberries are an exception, as to quantity of fruit produced; there being not over a half crop. This was due to the cold, late season, and the sudden hot weather which came just as the fruit began to ripen. With the shortness of the crop, prices ruled low for the inferior grades, while good, fresh, clean, bright berries sold quick for from \$4.00 to \$7.00 per stand. The fact is, there is enough good fruit grown, and people do not want the inferior grades at any price. As to some of the new varieties of strawberries, I can say the Jessie excels in quality, Bubach in quantity, Summit in size, and Haverland in general appearance of fruit. All have grown well, and I shall be disappointed if they fail. The Summit is a wonderful berry, but I think not a profitable one; I fruited Henderson, Cohanzick, Gandy, Monmouth, Mammoth, and Covell's Early, and

fail to see merit in any of them. A berry called Great American has been shipped into Cleveland from Cincinnati for two or three seasons, and its good qualities attracted local growers. The first home-grown fruit of this variety was marketed this year by two growers, and sold for highest prices. I saw the vines and fruit on the grounds of M. T. Thompson, and it is not the Great American sent out by W. Parry, some ten years ago. The health of the foliage did not impress me very favorably, as the leaves were curled, from what I considered to be mildew.

Raspberries were a good crop, and sold quite fairly. The ends of the bearing canes of the Cuthbert, on some plantations, withered and dried up in the midst of the picking season; no reason has been given for this. Among new varieties, the Marlboro' is winning favor.

The crop of blackberries was enormous, mainly of the Snyder variety; many were sold for \$1.00 per bushel.

The crop of currants was never so fine and large as they have been this season, and never so cheap; it was almost an impossibility to give them away, the latter part of the season. Fay's Prolific meets with little favor.

Gooseberries were plenty. They are marketed in the green state, and there are but few of the larger varieties grown.

Of cherries, there are not enough nice, sweet ones produced to supply the demand.

Plums were abundant and rather low in price; they were greatly injured by rot. I believe there is very little black-knot in our section.

Peaches have been very plenty and nice. Pears have also yielded well.

Apples have been abundant, and of excellent quality. I know of three orchards which were sprayed with arsenites with the best success. There are no new orchards being planted, and there has not been for some years.

In my report last year, I said, "It would not be surprising if, in a few years, grapes were as cheap as apples." That condition was very nearly reached this season. There were tons and tons of Concordes that did not net the grower more than a cent and a quarter per pound, and Catawbas fared but little better. The enormous crop of grapes surprised every one. Baskets and help were at a premium, and the continued cold, rainy weather during October, made it very unpleasant gathering the crop.

The N. Y., C. & St. L. R. R. received 350 car loads of grapes at Euclid station. This is probably two-thirds of the entire crop grown east of Cleveland—or say, 500 car loads, representing 7,500 tons of grapes. To market this crop of grapes, it requires 1,875,000 baskets, and this is but a small portion of the grape-harvest, and the wonder is, what becomes of them all. There are thousands of families all over our northern states that have not tasted grapes this year. Our crop goes to every large and small city east of the Rockies and north of the Gulf states. A friend of mine bought a basket of Catawbas, shipped from Euclid, in Omaha, for twenty cents, and he said they were nice. By this we see that this fruit is cheaper in that city to-day, than it was on the vines, two years ago.

You ask, what is the future of viticulture? No man can answer. The fruit and vine have been quite free from disease, only a little rot and mildew appearing. The sulphate of copper remedies, as recommended by the French vineyardists and the U. S. Department of Agriculture, have not been tried yet. One or two of our growers are prepared, and should mildew and rot appear, they will give the remedies a trial.

The varieties for market, rank as follows: Concord, Catawba, Delaware, Worden, Niagara and Pocklington.

The Worden is being planted quite largely, and will stand third on the list, if it does not occupy that position now.

Moore's Early does not come to the front as a market grape; the Worden sells better and is more productive, and comes into market at the same time.

Jefferson is good, but is too tender, and a weak grower.

Empire State does not strike the grower favorably, and it is doubtful if it has any merit for market.

Poughkeepsie Red is too weak in growth, and subject to mildew.

Ulster Prolific grows well, sets plenty of fruit, and is a good keeper. It is a very sweet grape, but has a hard pulp. It is fit for market at the same time as the Delaware.

Pocklington is a better grape than the Niagara, and I believe it will rank ahead of the latter as a market grape.

Moore's Diamond has made a slow, healthy growth, and I hope to fruit it next season.

Vergennes is a strong, healthy grower, and bears a heavy crop of medium-sized bunches. The berry is large; the quality is second-class. This grape is a good keeper.

Elvira makes a strong, healthy growth, and sets an enormous crop of compact bunches. It is useless to grow them, because the berries crack and are soured before they are ripe.

The Jessica has fruited with me for several years. I do not think it will ever become a market grape in my section; but think it has a great deal of merit for the sections of the country where the grape generally does not succeed well. It is a strong, healthy grower; early, sweet, and hardy; the bunch and berry is small.

The Brighton has been given quite a prominent place by the Horticultural press, through reports published. From a commercial point, it does not stand very high. It is a weak grower, very subject to mildew and rot, and is not hardy.

Mr. Cushman stated, in reply to questions upon his report, that he did not think the Summit strawberry promising as a market berry. The Great American, brought from Cincinnati, brought \$5, when Capt. Jack, May King and Wilson were selling at \$2.

The Vergennes grape is a good keeper; and improves after picking, becoming richer, and less watery.

President: The report of M. Crawford, of Summit county, is next in order.

As Mr. Crawford was not present, his report was read by his son, Mr. Wm. Crawford.

AD INTERIM REPORT FROM SUMMIT COUNTY.

BY M. CRAWFORD.

The season of 1888 has, on the whole, been favorable for the horticulturists of Summit county. Rain came at frequent intervals during the summer, and vegetation made a luxuriant growth. Towards the close of the growing season, there was an unusually large number of cold, rainy days, which retarded the ripening of late grapes, Lima beans, and all such things as need a long and warm season.

A frost in May, killed the grapes in many localities, and destroyed a large proportion of the strawberry blossoms. Notwithstanding, there was a partial, or full crop, of every fruit that grows in our climate.

Strawberries produced a moderate crop; but as we received only a small supply from the south, the prices were good, especially at the beginning of the season.

Another year's experience confirms me in the opinion that the Jessie, and Bubach's No. 5, are very valuable varieties, although both have failed in some localities.

The Haverland fruited with me this season for the first time, and made a remarkably good record. It is a wonderfully vigorous grower, free from rust, so far, and an enormous bearer. It produces a great number of large runners, and seems to be at home on any soil. It has a pistillate blossom, like most of our productive varieties. The fruit is quite long, always of regular form, and of good color all over. It is moderately firm and of fair quality. Taken as a whole, it has all the good points of the Crescent, with much larger plants and fruit.

The Mammoth produces some immense berries, and more of moderate size. I have heard so many contradictory reports concerning it, that my confidence in it is somewhat shaken.

The Monmouth gives promise of being a good, early berry. It is a vigorous grower, healthy and productive. Blossom, perfect. The fruit resembles the Wilson, but is of a brighter color.

From a single fruiting of the Gandy, I am inclined to think that it will prove a profitable variety.

I fruited the Miami in a small way, and am favorably impressed with it. Its prominent characteristics are productiveness, lateness and high flavor. I have, however, seen too little of it to say much, especially in the presence of Miami county horticulturists.

Mr. Loudon, the originator of the Jessie, sent me a number of his best seedlings, several of which, I am satisfied, are valuable. From my present knowledge, I would give the preference to the No. 15.

I had about a square rod of the Enhance, and its vigorous growth and abundant bloom gave promise of a great yield; but, being injured by a late frost, it produced no more than an ordinary crop. Its blossom is perfect, but it produces only a moderate number of stamens. The fruit is large, of regular form, and rather uneven on the surface. Color, very dark. When perfectly ripe, it is of good quality—otherwise, not.

Excelsior is a very desirable berry, producing a full crop of fine fruit of attractive appearance and good quality.

An unusually large number of new seedlings have been sent me for trial, and they are all in fine condition for bearing next year. As many of them are from experienced growers, I am looking forward to their fruiting with some anticipation.

There was a full crop of raspberries, which brought a fair price. The Taylor and Souhegan are the main reliance for early, and the Gregg, for late. The Palmer gives promise of great value for an early sort. The Hilborn is medium late, and a most admirable variety. I think it possesses every excellence.

Of the purple varieties, the Shaeffer is unsurpassed by any yet introduced. A new seedling of the same class, received from Connecticut, seems to be fully equal to it, and may be even more desirable in some respects. Melott's Favorite, an Ohio berry, possesses most of the good qualities of the Shaeffer, with greater productiveness. It is, however, rather smaller in both plant and fruit.

Blackberries are not grown extensively in our county. All the large, fine ones I have ever seen in our market were brought from elsewhere. The Lawton and Kittatinny are not reliable, and the Wilson has been planted only in a small way. The Agawam, Snyder, and Stone's Hardy succeed perfectly, and the Taylor is rarely winter-killed. A new variety received from E. M. Way, of Geneseo, Illinois, fruited with me this season, producing large and excellent berries for a long time. I think it is not yet in the market. The Sadie, which was sent out from Iowa, with the claim that its cells are so arranged that it will resist a very low temperature, produced no fruit, and made but poor growth. I fear the new arrangement of cells is not a success.

Gooseberries were abundant. A new variety, the Orange, received from Judge Miller, of Missouri, is of better quality than any I have heretofore fruited. It is of a deep color, and not larger than the Downing.

It was not a very good year for grapes. Rain and cool weather were favorable to

mildew, which was universally prevalent. Some young vines planted in the spring, started well and then mildewed and shed their leaves without ripening an inch of wood. Among this class were the Downing, Moyer, and Mills.

Apples were about one-third of a crop, and not very fair. There are comparatively few well-cared for commercial orchards in our county. They are not only neglected, but the land is exhausted in producing other crops. Pears are more reliable with us than apples. We had a full crop this season, and I saw Seckels selling for sixty cents a bushel and Bartlett's for a dollar.

Peaches were unusually abundant.

Plums rotted to such an extent that there was only a moderate crop at maturity.

People are but just commencing to spray fruit trees. There is, however, every reason to believe that when this is thoroughly attended to, the results are satisfactory.

Our county produces very large quantities of potatoes, and never so many as this season. The blight struck most of them before maturity; but, as a rule, they were dug promptly, and there was very little rot. The Beauty of Hebron, Lee's Favorite, Clark's No. 1, Burbank, and Empire State are grown largely. Potatoes are so abundant and cheap that consumers are unusually discriminating—and those who fail to sort carefully, find it up-hill work to dispose of their crop. It is doubtful if as many varieties are grown in any other county in the United States. E. E. Stine, one of our specialists, raised nearly eight hundred kinds, six hundred of which he exhibited at our County Fair. E. Wernitz, O. W. Harris, C. Welch, Wm. Babb, R. Deeds, and others, grow from twenty, to one hundred varieties, and some of them raise a large number of seedlings.

Market gardening is carried on more extensively every year, with us. Those engaged in it, have no reason to complain, this season. Cabbages, cauliflowers, celery, turnips, parsnips, carrots, vegetable-oysters, onions, beets, and all vegetables that delight in a cool, moist climate, made a splendid growth. In fact, success was almost as easy as failure.

Our people are learning more and more about Floriculture and Ornamental Planting. It is safe to say, that every lady is a lover of flowers, and that she will put forth quite an effort to gratify her wants in this direction. It is only necessary for some one to take the lead in ordering seeds, plants, and bulbs; and a large number will join the club. Last spring, I patronized about a dozen seed men and florists, and this fall, I sent to six different parties for bulbs for myself and neighbors. Every plant creates a demand for more, and thus the good work goes on and will continue to go on until the products of horticulture shall have contributed towards the beautifying of every home.

President: Next in order is the report of Mr. Farnsworth, of Lucas county.

AD INTERIM REPORT FOR LUCAS COUNTY, FOR 1888.

BY W. W. FARNSWORTH, OF WATERVILLE.

The past season has been a fairly good one for the fruit-growers of Northwestern Ohio.

The season has been neither extremely wet nor dry, hot nor cold.

Strawberries, although a short crop, as compared with the yields of the two preceding years, generally paid the growers a larger profit than in those years of superabundance.

I still plant Crescent, fertilized with Sucker State, when I want a large crop, although Bubach and Jessie are promising. Currants were an unusually large crop, and in many markets the prices were low. On my soil, the Victoria proves the most profitable, portions of my patch of that variety, averaging about 6 quarts per bush, this year.

Fay is worthless with me. Red Dutch succeeds well, and Cherry does moderately well, but is better on rather heavier soil.

Gooseberries were also a good crop. The hot sun scalded mine badly. Mr. John Siebenthaler, of Dayton, informed me that he saved his, by scattering clover over the bushes.

The Industry is a magnificent berry in appearance. Should its vigor and productiveness equal its size, it will be a decided acquisition.

Early Richmond cherries did not seem quite as plentiful as usual.

The Dukes were a good crop.

The Marlboro' Raspberry improved its former record this season, and was one of our profitable varieties.

Cuthbert is still our best red raspberry.

Gregg, Ohio, Hilborn and Souhegan were all a success, this year.

With Souhegan, Hilborn, Gregg and Ada in the field, there seems hardly room or need for anything else; and yet I believe we will find a very decided acquisition in the Palmer, originated by Mr. F. R. Palmer, of Mansfield.

I was astonished at the earliness, productiveness, size and quality of fruit shown on young bushes of this variety on my own grounds this season.

In blackberries, Snyder and Taylor still hold the field. We have not tested the Erie sufficiently to speak of its merits.

Clapp's Favorite, Howell and Anjou were our most profitable varieties of pears this year. Kieffer stands at the head, in everything but quality—but unless it is of far better quality cooked, than raw, it is not worth planting as far north as Northern Ohio. Farther south, the quality is probably better.

Winter pears matured much earlier than usual this year.

The peach crop of Northwestern Ohio, especially that of Catawba Island and the adjoining shores, was simply enormous.

Grapes in our own county, were badly affected with rot.

In my own vineyard, Worden, Pocklington, Lady and Delaware, succeeded best.

Plums were a very heavy crop, as this seemed to be an off-year for the curculio.

Our apple crop was very light, and when not sprayed, very defective.

Among the newer varieties, Grimes' Golden, Ben Davis and Stark seem to lead.

Our orchardists need a fruit-house.

Mr. Farnsworth's report brought out some questions, and in reply, he said the Victoria currant was the variety that yielded 6 quarts to the bush. From 14 bushes, he picked 85 quarts.

The crop of vegetables, in Lucas county, was very large. The cabbage market was broken, and fine, large, solid heads were sold from 75 cents to \$1.25 per 100.

In potatoes, Empire State took the lead. Lee's Favorite and Pearl of Savoy, were both good.

In answer to a question if there were any difference between the borer and the currant-worm, he said they were entirely different. The currant-worm destroys the foliage; the borer penetrates the wood, and bores in to the center of the young shoot; but the borer never troubled his bushes; the only trouble he had, was with an insect that attacked the

berries, causing them to drop; but usually not more than two or three berries in a cluster.

T. Munger said he would go two quarts better, on Farnsworth's currant report. He had also had the same insect trouble on his berries, but did not consider the injury very serious, so far.

L. B. Pierce remarked that he had figured up the value of an acre of currants, yielding at the rate reported by Mr. Farnsworth, and found it to be \$900.

Geo. W. Trowbridge said the currant-borer was, in some places, very destructive, and prevented many quarts being raised to the acre. It was a very serious trouble, and the only way to keep the borer in check was to cut off, and destroy, by burning, all the affected wood, when pruning, which he does in the fall.

The President said he had been much troubled by this pith-borer. It was produced by a moth, which deposited its eggs upon the wood, singly, near the buds. When hatched, they bore into the stem, to the pith, which they eat, burrowing upward, several inches. The vitality of the stem is weakened; the fruit of inferior size upon such bushes as are affected; they sometimes break off at the point where the worm enters, but if large enough to support the weight of foliage and fruit, they soon become sickly, and finally die. The affected stems can usually be detected in the month of June, and all such should be cut off, at or below the point where the borer entered, and burned, at once.

The report of Mr. N. Ohmer is next in order.

AD INTERIM REPORT FROM MONTGOMERY COUNTY.

BY N. OHMER, OF DAYTON.

This, Mr. President, has been a fruitful year, not only abundant, but remunerative; so much so, that the credit side of my ledger is quite satisfactory. In my section, the strawberry-crop was not large, on account of dry weather just at their time of ripening, but the prices at which they were sold, were quite satisfactory, and brightened up the countenances of our strawberry-growers.

Raspberries were a good crop, and sold for good prices. The same can be said of blackberries. That is, those that attended to them in the right manner, were well paid for their trouble. I know of some growers, I might emphasize the word by saying *many* growers, cannot report so favorably. There is a large class that are either too indolent, or know too much, and do not cultivate at the right time, nor do they cut back the laterals sufficiently for good fruit. This will particularly apply to those who grow the Snyder blackberry, the variety that is mostly grown. You cannot grow a good crop of good fruit, and at the same time, a good crop of sprouts between the rows. If you allow the sprouts to grow, you cannot cultivate, and you cannot have good fruit unless you do cultivate, or mulch the entire ground. I never fail to have a good crop of blackberries, that sell at good prices.

My system is, to cultivate between the rows two or three times in the spring and early summer; the last time just before they begin to ripen. I use a cultivator that cuts-

all sprouts in the way. No more work after gathering the fruit, except the cutting out and burning the canes that bore fruit. In the spring, I cut back all laterals to from eight to twelve inches. Unless you do so, you will have an immense amount of berries that will remain small, and in many cases, dry up on the bushes. Whereas, by cutting back, and cultivating, I gather Snyder blackberries that are large and delicious, even to the last berry.

In early summer, when shoots grow rapidly, I pinch them back, at from three to four feet in height. They then grow stout laterals, which will produce good fruit the season following. The same treatment, I give my Taylor blackberry. This latter is, with me, the nicest berry I grow. No blackberry looks so well in baskets, or boxes, or sells for a better price. It is a later variety than Snyder, nearly as hardy and productive. The old Lawton still does well with me. They produce a crop of fruit eight out of ten years.

Many of you know that in our part of the State, most berries are put in half-bushel drawers, instead of baskets. All I grew, hundreds of bushels, were so packed, and so preferred by those who buy them. Four drawers make a stand (two bushels), that cost us, when new, forty cents. I never put berries in old drawers, which are, like old baskets, always dirty, but into new and clean drawers, as they bring enough extra money to pay for the package. Some growers say that berries don't pay. That is true only of those who ought to follow some other business.

Having a pretty large pear-orchard, I am no doubt expected to say something about that fruit. Well, pears are a paying crop, much more so than apples; for, whilst we have apples only once in two to four years, we have more or less pears every year. Last year I had almost as many pears as this, and they were sold for nearly double the price realized this year. As plenty, and cheap as pears were sold this year, they were a paying crop. All varieties bore well the past year, and like peaches, whoever had a peach or a pear tree, had fruit. That might, however, apply to all tree-fruits. In all my life, I have no recollection of such an abundant fruit year. Of course, I had a large crop of apples, and, plenty as they were, I am sold clean out, and got a good price for them. Once I had a dear experience in holding over about a thousand barrels of apples, and was forced to sell them in the spring, for whatever I could get, and that did not amount to much more than the cost of barrels, trouble and commission. This year, I had them mostly hand-picked, selected them closely, selling the best at 50 cents per bushel, and made near 150 barrels of cider out of the small ones, which has all been sold at 10 to 15 cents per gallon, by the barrel. All sold to families, for vinegar, of course.

My apple-crop paid, and paid big. Do you want to know why I sold my apples so readily, and at the prices I did, considering the quantity there was in the market? I will tell you. As soon as I saw, when the trees were in bloom, that there was a prospect for a big crop of apples, I at once procured one of Nixon's spraying machines, and gave my apple trees a dose of London purple, of the strength of a half-pound to 50 gallons of water, applying it just as they were going out of bloom. I soon discovered that the mixture was too strong, as it discolored, or rather burned, many of the leaves, of course, to the injury of both the tree and fruit. In two weeks thereafter, I gave them another dose, this time, five ounces to 50 gallons of water. This did no harm to the foliage, and no doubt sickened to death many young codlings, and the result was a big crop of smooth apples. I will not say there were no wormy ones, but I will say that the London purple did the business, and sent many codling moths, and other insects, to the land where there are no apples to eat, and the result was as stated above.

I made a mistake that is quite common, when I planted my apple orchards, thirty years ago. I planted most varieties too close, namely, thirty feet apart. That distance will do for some varieties, but for strong-growing and spreading trees, forty feet apart would have been better. Now, my Baldwins, and some other varieties, have grown into one another so much that the lower limbs are dying, which is the natural result of too close planting.

I can not sell, profitably, summer or early fall varieties, except the Maiden's Blush. These, also, were a glut in our market this year. Varieties which pay me, are Baldwin, Spy, Rambo, Smith's Cider, Rome Beauty, and Hewes' Virginia Crab, for cider. I have 40 trees of the latter, that produce me an average of 15 barrels of cider per year, that I sell readily for [20 cents per gallon by the barrel, and 25 cents in smaller quantity. These trees, which are not large, will average me about \$150 per year. When I sell cider, I invariably charge for the barrel, or other package.

I had a nice crop of grapes. All varieties bore full crops, with but little rot. I have about 15 varieties, planted only for my family use, and to test some new varieties. I sold my surplus at from 5 to 8 cents per pound. I am very much pleased with the Pocklington. They are much like the Niagara, and should be in all collections.

Fruit-growers should not be discouraged, although the growing of fruit is not as profitable as it has been. We grow more and better fruit than was grown years back. Then, there were not so many varieties, and, on account of the high prices at which fruit sold, a large class of our people could not afford to indulge in such healthful luxuries. Now, at present prices, all can and do, buy and eat the delicious berries in their season, and I am glad to be in a business that does so much for the enjoyment and comfort of mankind.

F. R. Palmer was then called upon, and reported as follows:

AD INTERIM REPORT FOR RICHLAND COUNTY.

BY F. R. PALMER, OF MANSFIELD.

The year 1888 has been one of varied success in Horticultural pursuits in Richland county. The spring was cold and backward, yet all tree fruits bloomed in profusion.

Continued cold rain, however, at the time of blooming, appeared to have destroyed the pollen to a great extent, and the fruit failed to set well.

The apple, perhaps, suffered more from this misfortune than any other fruit, hence apples in Richland county were not more than 50 per cent. of an average crop; and after the codling moth had "played hob" with about 75 per cent. of that half-crop, but little good fruit was left.

PEACHES, in favorable localities in Richland county, produced a fair crop; but peach culture has been neglected in our county, owing to frequent failures. But few trees have been planted of late, and even the few planted have been too much neglected. Yet, we have many elevated sites that might be devoted to peach culture, and be a paying investment. Yet most of the peaches consumed in Mansfield, and even by the agricultural community, came from the south-eastern part of the State, and the Islands in Lake Erie.

Although peaches were a fair crop, generally, the price ruled quite as high as last year.

PLUMS were quite plentiful, and of good quality, yet, prices were low. Damsons sold for \$1.00 per bushel, and Lombard for \$2.00.

CHERRIES. Early Richmond produced a fair crop. Other varieties, about half a crop.

PEARS were a light crop; not half enough to supply the home market. Flemish Beauty, Clapp's Favorite and Lawrence succeeded best. Kieffer's Hybrid also fruited well, and is much better in quality than I had been willing to concede. If gathered at the proper time, and kept until December, or later, it is a valuable variety.

STRAWBERRIES were only half a crop. The extreme heat and drouth of 1887 was not favorable to the growth of plants. The spring was cold and backward, and two or three quite heavy frosts at the time of blooming, cut the crop short. The yield was

light, and quality not very good. The past summer has been favorable for the growth of plants, and the prospect for next year's strawberry-crop is better than an average.

The Crescent Seedling, Wilson, Kentucky, and Manchester are the principal varieties grown.

Of the newer varieties, Bubach is, perhaps, the most promising for the commercial strawberry-grower.

BLACKBERRIES were a success this year. The past winter being mild, and the summer cool, with sufficient rainfall to develop the crop.

The Snyder and Taylor's Prolific are the principal varieties cultivated. Stone's Hardy is small, and not very good in quality; not near so productive as Taylor or Snyder. The Erie has not yet fruited with us.

RASPBERRIES, as usual, were the most successful fruit crop of the season. Where properly cared for, and cultivated during the drouth of the previous year, and careful culture given up to the time of ripening, raspberries yielded a paying crop.

The Gregg, Souhegan and Ohio are most extensively grown. Shaeffer's Colossal succeeds well, but is not much grown, from the fact that its color is not attractive in the market. It is, however, more in demand as it becomes better known. Cuthbert does well on warm, sandy soil, but fails on cold, clay land.

GRAPES were almost an entire failure from rot. This disease has ruined our grape crop every year since 1878.

Vines trained on the ends of buildings, or in gardens, ripened more fruit than for several years past, but in the open vineyard, the crop rotted so as to be unfit for market. It is to be hoped that this fatal disease will pass away in time, as we regard the grape as one of our most wholesome and refreshing fruits. So many choice varieties have recently been introduced that we could have grapes from the latter part of August until mid-winter, or even later, if properly cared for.

Mr. Palmer remarked upon the advantage of mulching for blackberries. He had observed an instance where leaves had blown upon a portion of a blackberry plantation to a depth of about six inches, and which had borne enormously—greatly exceeding that which was not so covered.

B. F. Albaugh then read the following report:

AD INTERIM REPORT FOR MIAMI COUNTY.

BY B. F. ALBAUGH, OF COVINGTON.

The past season, in Western Ohio, has been remarkable because of its universally large fruit crop. The dryness of the preceding summer and autumn had thoroughly matured the fruit buds, and these passed through the rather mild winter safely, and the result was that *everything* seemed to succeed. Even the tender fruits, such as apricots and peaches, escaped injury and bore profusely.

APPLES were plentiful and quite free from blemish; even where spraying was not practiced; the fruit was so very abundant that insect depredations were scarcely noticeable. Red Astrachan, Maiden's Blush, and Duchess of Oldenburg, for summer, and Ben Davis, Rome Beauty, and Smith's Cider, for winter, are most profitable.

There are but few peach-orchards in Western Ohio, as the uncertainty of the crop seems to discourage planting; yet wherever trees existed, they were, this year, heavily laden with fruit.

And CHERRIES were successful beyond all precedent. Even the Dukes and Bigar

reaus were loaded. The Morellos are the most reliable with us, and of these the Dye-house, Early Richmond, and Montmorenci, were especially satisfactory. The Wragg fruited, with us, this year, for the first time. It is a dwarf in habit, and ripens very late, after other cherries are gone. It seems to me to be a valuable variety.

Because of the immense crop, the price of cherries in the market was greatly depressed, and growers realized but little more than cost of gathering.

STRAWBERRIES were not a large crop. The severe drought during the preceding autumn seemed to retard the full development of plants and fruit-crowns, and dry, hot weather, at season of ripening, did not mend matters. Prices, however, were good, and the result on the whole, was not very disastrous to growers. Plants were scarce in the spring, and commanded fair prices.

Of newer kinds, Bubach appears to lead all others as an early market berry, being vigorous in habit of growth, of good size and color, and quite productive. Its many good qualities will doubtless make it a general favorite.

Jessie seems variable.

Haverland is very promising, and is being largely planted.

Miami continues to grow in favor. Indeed this promises to be what fruit-growers have long sought—a really productive and good, large, late berry. Its vigor and ability to withstand drought and heat is marvelous. It is of good quality, large in size, and even more productive than Bubach. This description applies to the variety as seen on the grounds of the originator.

RASPBERRIES were a good crop. Gregg still leads. Souhegan and Ohio bore heavy crops of medium-sized berries. Shaeffer continues to gain in public estimation. It seems to have fairly overcome all prejudice against its unattractive color. It is productive, and soon wins its way in the market.

BLACKBERRIES were abundant, with Snyder at the head. Taylor is irregular and straggling in habit, and is frequently winter-killed. Stone's Hardy overbears, and hence is often small and unsalable. Severe pruning, in spring, may obviate this objection.

Erie has not proven very satisfactory.

Early Cluster, Wilson, and Early Harvest, are not sufficiently hardy for our climate.

Lucretia Dewberry has continued to produce large crops of fruit, but seems to require wide planting, close pruning, and slight protection during winter. Its early period of ripening enables it, commonly, to escape the drought which so often cuts short the blackberry crop. The fruit is found to be much superior to common blackberries for either canning, jams or jelly.

GRAPES were again a full crop, and measurably free from rot or mildew.

Among blacks, Worden continues to lead, Early Victor proves to be very early and of excellent quality. Niagara was also a success. Brighton is one of our best reds.

The most surprising feature of the season, however, was the immense crop of PLUMS. All varieties seemed successful, and trees were loaded, even under circumstances seemingly the most unfavorable. The most the curculio seemed able to accomplish, was to thin out the surplus fruit.

GOOSEBERRIES and CURRANTS were everywhere loaded, and as hellebore and arsenites were generally applied in proper season, the immense crop was brought to perfection.

Mr. J. C. Stein, a member of our County Society, has originated a new seedling gooseberry, which in size, productiveness and freedom from mildew, is a marvel. It is certainly as large as Industry at its best, and, unlike that much-lauded berry, it is entirely free from spines on the fruit.

But little of the large quantities of fruit grown in Western Ohio is shipped to distant markets. The excellent home-demand afforded by our numerous and rapidly growing cities and towns readily absorbs our whole production, and each succeeding year shows a constantly increasing consumptive demand, so that the outlook for the careful horticulturist is very hopeful.

The influence of the State and local societies has much to do with the rapid progress which is being constantly made in methods of culture and in the introduction of improved varieties.

Mr. Albaugh remarked that he was, this season, more than ever impressed with the fact that Ohio was a great Horticultural State, having a great variety of soil, and climate. He had observed, on adjoining farms having apple orchards, upon one of which spraying the trees was practiced, both had fine fruit and produced well, and although the unsprayed trees had much wormy fruit, the yield was so large the codling moth could not injure it all.

He had found Shaffer's Colossal raspberry to do best, with close pruning.

The President then called for report from Jas. Edgerton.

AD INTERIM REPORT FOR BELMONT COUNTY.

BY JAMES EDGERTON, OF BARNESVILLE.

The Centennial year, now just drawing to a close, has been one of unusual abundance in most branches of horticulture.

It is true that our strawberry crop was shortened off rather prematurely, and we did not realize as abundant a crop as we anticipated in the opening of the season. They commenced fairly well and found a good market until about the height of the season, when we had a few very hot days, so it was almost impossible to get the berries picked and under shelter, without their getting scalded on one side, which injured the sale of them. It also damaged the growing berries, by killing the stem just in the bend, as it was turned over, so they quit growing. But the same heat that shortened the crop of strawberries hastened up the raspberries, and they were ready, as usual, to follow on.

Of the newer sorts of strawberries, the Jessie promises well, and I hope may hold on and prove a success, for it certainly is fine; but if it goes as the numberless varieties that have preceded it within our recollection, we will almost be ready to look with suspicion on all the highly-lauded pets.

Bubach's No. 5 makes a very fine start also, and is a more persistent grower than anything on the list, and seems amply able to take care of itself, and altogether seems to make a very fair promise. I notice one thing about it, which, if we could have a proper list like it, I believe it would be a good thing. And that is, it ripens its fruit all together. It commences rather late, but the fruit soon comes off; (or so it was with us), and not taper off with small ones.

Warfield's No 2 has not yet fruited with us—but from its habit of growth, I have a hope of its future. It is wonderfully prolific of plants, and I think will rank as everybody's berry.

Raspberries were a good crop; but for the most part, prices ruled rather low. The first ripening sorts, as Souhegan and Tyler, sold at pretty fair prices, but there have been so many Greggs planted that when they let loose, there is always an over-stock on the market, and prices are sure to be depressed, and unless one is prepared to handle them, there will be loss, as they will not keep long.

Shaeffer holds its position as the best on the list for canning and home use, and I believe will be sought for in market when it becomes known; provided, our express-men would learn to handle our fruit as they should.

Blackberries were abundant, and nothing but fine fruit would pay for handling.

Wilson Junior was very fine, and yielded for us a handsome profit, ripened early, and were disposed of at good prices before it was known there was so great a crop.

Lucretia Dewberry was fine, but I am fully of the mind that where Wilson Jr. does well, Lucretia is not needed and will not be continued.

CHERRIES were a moderate crop, but there were so many raspberries and wild blackberries the birds found ample pasturage, and left the cherries for us.

Our crop of PLUMS was rather a phenomenal one, and I thought at one time I had a bonanza, as I had a few little plum trees just large enough to bear; and I had provided myself with a spraying-machine, determined to give it a trial, so we sprayed our little trees twice, at a cost of not over five cents per tree, and I do not think there was a stung or wormy plum on them; but they were so loaded, we had to do the thinning ourselves, and just pulled them off by handfuls till they lay in piles under the trees, and still the trees were so loaded when our centennial commissioner came over; he said he never saw so many plums to the square inch in his life. But on looking around, I found others had plums that did not spray; however, I found a part of their's were stung, and some wormy.

Still I shall plant some more plum trees, believing the curculio can be mastered.

PEACHES were abundant, and so low in price all ought to have had a supply, for they were peddled about at 15 to 20 cents per bushel. The past season doubtless was no exception to the rule that the early sorts, those ripening very early, sell for the most money, and they sold readily at more than three times as much as those ripening a little later—and, although coming in along with plenty of raspberries, they were sought for at fair prices.

PEARS were a good crop, and also sold at prices which brought them within the reach of all.

QUINCES also, although of rather poor quality, were so abundant and cheap, all ought to have enjoyed them.

I now come to APPLES, which were an immense crop, and prices so very low they scarcely paid for hauling through the mud, of which we have had such an abundance.

One dealer at our place has handled between thirty and forty thousand bushels, and other parties from two to ten thousand bushels.

I also tried spraying apple trees, and for a while I thought I had a good thing, but I found others had nice apples. And the secret of it doubtless was, our apples were all taken with a minus sign last year, and so the crop of worms were not on hand.

As it was, we had a very abundant crop of apples of extra fine quality, large, fair, and clear of worms. And the greatest consolation about it is, they were so low in price that all ought to be supplied.

POTATOES were an abundant crop, and prices such that the poor should be supplied.

Of varieties, many still hold on to the old Early Rose, and it does quite well. Lee's Favorite, for early, is now largely grown, and I think is very satisfactory. Summit has been introduced, and, I think, has given good results.

AD INTERIM REPORT FOR ROSS COUNTY.

BY J. R. HURST, CHILLICOTHE.

This year, 1888, has been a year of jubilee to lovers of good fruit, but not satisfactory to the fruit-grower, financially, in our county. We had undoubtedly the largest crop ever produced, and taking it generally, the nearest to perfection, with prices so low that it was placed within the reach of every one, and thus making a memorable feature in Ohio's Centennial.

The past winter was very mild, mercury falling not more than eight degrees below

zero. The record in my journal shows a fact worthy of note, that the last days of the fall and winter months were the coldest. The spring was very late, dry and cold.

Peach-buds were well developed the middle of March; but were checked by cold, and kept from blooming until April 15th, and so acclimated that they could withstand the freezing weather which we had when they were in full bloom. The ground was frozen on the 13th, 17th, 21st and 25th, the last-named morning two degrees colder than at any time previous for three weeks.

STRAWBERRIES were not two-thirds of an average crop, owing to the plants having made no runners the previous season on account of drought. Prices were low—from six to twelve cents per quart. Not more than fifteen acres are cultivated for market.

RASPBERRIES were an average crop; quality good, prices low.

BLACKBERRIES were not abundant, yet a sufficient supply; prices from ten to twenty-five cents per gallon. Not many cultivated varieties grown, but scores of acres in wood, old, worn-out and waste land, and some farmers allow them to grow in fence-rows.

CHERRIES were a fair crop.

GRAPES more abundant than usual, and of better quality.

PLUMS were a full crop on healthy trees, but many rotted before ripening, from the effect of wet weather. The Wild-Goose, Green Gage, Imperial Gage, Reine Claude, Bradshaw, Pond's Seedling, and Washington, bore excellent fruit, and were free from black-knot, though surrounded by several other varieties dying with that malady.

PEACHES were an immense crop, but below the average in size and quality. Doubtless would have been improved by thinning, but prices would not admit of extra labor. This season, the entire crop will not much more than pay expenses of marketing.

PEARS were a good crop; but many were destroyed by wind-storms before they were fully matured.

QUINCES were more than an average, and very good.

The APPLE CROP was enormous; of excellent quality and almost perfect in appearance. Thousands of barrels have been shipped from Chillicothe, and thousands more are awaiting sale. One firm has bought and shipped nine thousand barrels, at a cost of more than seven thousand dollars. Several other firms have shipped largely. Many of the old varieties, such as Belleflower, Ortley, Roxbury Russet, Rhode Island Greening, and Baldwin, that have rested for a long time, have given us such an abundance of their luscious fruit, that as yet we have no market at home or abroad for such varieties as Ben Davis, Limber-twig, Stark, Smith's Cider, and Rome Beauty.

The effect of the codling moth and cureulio was almost invisible this year in orchards. Had we used a sprayer, we should undoubtedly have given it undeserved credit.

FLORICULTURE is receiving more attention from both the amateur and professional. Two firms in our county-seat are successfully managing ten or twelve green-houses, and flowers are seen in nearly every home. Market-gardening is a paying industry. Five hundred acres of land are thus used. Cabbages and celery are shipped in large quantities.

FORESTRY is receiving some attention. A good many trees are planted around both public and private buildings, and by road-sides.

We have no Horticultural Society, only in name, nor Farmers' Club, in our county; hence we hail with delight the coming of the Farmers' Institute.

President: I will now announce the names of the Committee on Memberships. It is desirable that we should add to the number of members of the State Society, as we have our regular expenses to meet for carrying on our work, and have no appropriation from the State for this year.

The membership fee is only \$1.00 per year, and it is hoped that we shall have an addition to our members, through the solicitation and influence of the committee, which will be composed of the following gentlemen: B. F. Albaugh, John Pierce, Timothy Munger, J. W. Simmons and J. D. Krueschke.

The next thing in order, is reports from County Horticultural Societies. We should like to hear from Hamilton county.

Mr. Farnsworth: I would suggest that these reports be handed in, without being read. I think we would rather spend the time discussing the reports that have been read, than in listening to others.

President: I think we had better have a motion to that effect.

Member: The reading of all these reports is more or less interesting and valuable, and we have some time yet before we adjourn. I believe it would be better to have them read, if approved by the Committee on Business.

Mr. Longenecker: The Committee has decided to follow the programme as nearly as possible. The papers are generally short.

President: The voice of the Committee is, then, that we continue the reports. There is, however, in the report of Mr. W. J. Green, matter in reference to the influence of commission-men, and the manner in which they control the markets, that I would like to have considered somewhat further. I do not know if there is any possible way of meeting it, but it is not improbable that we might think of some way by which we could take the matter into our own hands. The facts are, that the commission-men control the sales of our produce, together with other people's property, put into their hands to sell, without proper regard for our interests. The boards of trade of all the great cities are made up, largely, of commission-men, and men who are not able to do business on their own capital; and when we send our produce to commission-men, we often cast it upon the waters, without being able to control results to any great extent.

Mr. Palmer: I am not quite willing to believe that there are no honorable commission-men. Last winter, after our meeting was over, at Toledo, I met a gentleman in that town, a Mr. Geroe, who is quite an extensive commission-merchant, with whom I have had some little dealing. He happened to be present when I read a paper, and the next time he saw me he said he thought I was rather hard upon the commission-men; and I told him I would like to have him attend our meetings. He said, for his part, he would rather there was no business done in that way; and he told me a great many things that were useful to me. Then last fall, I had a talk with one of the commission-men in Columbus, and he admitted

that the commission-men do not all do the right thing, but still it is not just to say there are no honorable commission-men.

Mr. Farnsworth: I have known many instances of loss, when berries come from a distance; but in our own market, my fruit is all sold to one merchant, and I make it a point to go to the market as often as I possibly can. I do not take in the fruit myself oftener than once a week, as we have quite a large market there, just adjoining the commission house; and I am well satisfied that, in many instances, it would be better if all the berries in Toledo were handled by commission-merchants. I have known many instances where these commission-men have kept up the prices; so I think when we do find an honorable one, we should give him credit.

Mr. Ohmer: I grow a good deal of fruit, and sell altogether through commission-men, allowing a commission of 10 per cent. I do not go to market myself—never have, nor never intend to. I always see that my fruit is put up in good order. I have two men handling my fruit, each one trying to overdo the other. I have only found one commission-man to do me a mean trick, who got ahead of me by getting barrels made over-size; but that was only one instance, that happened this year, and it should not condemn the rest.

Mr. Green: In my remarks I did not refer to any particular commission man; only that we do not raise enough berries about Columbus to supply us, so we must buy our berries somewhere else. Now, we depend on Barnesville growers for our strawberries, and there is no reason why they need send their berries on commission, as they could just as well sell them for themselves. Perhaps they are as well satisfied, but they do not know what they are to get for them. I do not mean to say that by so doing, they would surely get higher prices, but they need not run the risks of selling on commission.

President Tryon: By what honest method do the Columbus commission men get, and make use of the Barnesville crates?

Mr. Green does not regard these methods as honest; and he would be glad to see all fruit, as far as possible, sold by the growers direct to the purchasers—and not through commission-men.

F. R. Palmer: Mr. Green's remarks are all right. But where we are obliged to sell our fruits on commission, I have been advised to sell only to one man in a place—as where fruits are placed in the hands of different men, your own fruits are in competition with themselves.

J. W. Simmons: I grow fruits and plants for a living, and do business almost entirely through commission-men. I am glad to say I have found them all honest. I pay about 15 per cent. commission. The use I make of old fruit boxes, is to grow early garden plants, cabbages, tomatoes, etc., in them.

T. Munger: Said he would just give a little of his experience. He does not ship any of his fruit to commission-men; but sells direct to customers near home, and finds it very satisfactory.

J. W. Simmons: Has made most of his shipments to one commission-man, who was responsible, and had proven himself honorable and capable. He keeps prices up to a fair point, when possible, and gives no cause for complaint; and takes everything in season.

W. C. Harris wishes there were no commission-men in Toledo. All like mules, had long ears and sticky fingers. They often solicit shipments to over-stock the market and crowd down prices. As a rule, though, they like to do well both for themselves and customers, or they could not keep up; but they look out for themselves first. Have sometimes lost by sending to commission-men who allowed the fruit to spoil.

President Tryon: Thought it better for both, where a good and competent commission-man was selected by a fruit-grower, and made his agent, giving him exclusive sale of his products.

L. B. Pierce: It appears there are two classes referred to. Some of them are simply agents. There are many things we ought to consider. A commission-man can not always do as he would. Fruit goes in at all times and in all conditions. The market is often glutted, fruits injured, prices drop, and much fruit cannot be sold. I remember at the time of Garfield's funeral, I saw loads of fruit spoiling around the commission houses, because there was no one to care for it. Commission-men are sometimes loose and careless in their way of doing business, and do not always do as they would be done by. Where I live, I do not often have to sell to commission-men, but once in a while, ship a small amount of stuff to Cleveland, and not always with satisfactory results.

T. F. Longenecker: We find that commission-men do often solicit shipments of fruits, and get a lot of it on the market, when they do not know what they can get for them. I prefer to sell my berries to commission-men for cash, and can do so, when there is a demand, and fixed prices. If I ship my berries to a man to sell, I should know in a day or so what I am going to get for them; and a man who will not report sales to me promptly, will find his shipments stopped.

N. Ohmer: Does not agree with all that has been said. His commission-man pays him for all berries sold, less ten per cent. Our markets are often filled with poor raspberries, for which some people would rather pay a low price, than a little more for good ones. Nevertheless, they do not come in competition with ours, for they are sold to people who appreciate good berries. We sell all at home. If it were not for commission-men we could not raise one bushel, where we now raise a thousand. They know just when to sell them, and where they can obtain the highest prices. I

know they get all they can for me, and I run no risk for my money, and I have never lost a cent yet, in that way. I raise one hundred acres of raspberries, and it takes all my time to take care of them and put them in good condition for market. My commission-merchant sells my fruit principally to hucksters, retail fruit-stands, and grocers. I should be obliged to quit the business, if I could not do it in this way. I would suggest that as we have been in session three hours, it would be beneficial to adjourn.

The motion was made and seconded, and the meeting adjourned to meet at 7 P. M.

WEDNESDAY EVENING, *December 13, 1888.*

The meeting was called to order promptly, at 7 o'clock, by President H. G. Tryon, who announced the first thing in order to be the address of welcome, by Mayor J. F. McCaskey, of Troy. The Mayor responded, as follows:

President, Members of the State Horticultural Society, Ladies and Gentlemen:

The pleasant duty devolves upon me to speak to you words of welcome to our little city, and to say to you that we are glad to see you; and as we look about us, we can perceive how much has been drawn from that branch of husbandry which you represent, that has been profitable to other industries and manufactures. It is to your labor, and to your observation, that there has been made the marked improvement in the various fruits, which add so much to the pleasures and comforts of life. In this way, when everything is going on to improvement, I am satisfied that this department of industry (as I may call it) has kept pace with the times, and, as I was thinking to-day, in no one has it been more visible than in this branch of Horticulture. For instance, the improvement of the strawberry. As I remember it in my youth, it was a very small and inferior fruit. Now, when I look at it in its present state of improvement and usefulness, and when I think that this is only one of the many valuable fruits that have been improved, I can truly say, that you have kept pace with manufactures, in your time, by encouraging Nature to do her best. You are devising the best means to make Nature yield her choicest treasures for the benefit of mankind, and I trust you have been personally and profitably rewarded. And, again, I think there is no county in the State of Ohio that holds more of this class of people than that of which our little town of Troy is the center, or that there is any portion of it that has reaped more benefit or advantage from the cultivation and improvement of those plants and trees which are represented by the Horticulturists of the State. There are many hundreds of people in this neighborhood, who are dependent for their livelihood on the selling of fruits, and trees and plants, and, as I said before, you are doing one of the noblest works of man.

Now, I would say, we extend to you a cordial welcome to the courtesies of our little town. We possess, I think, in a great measure, many of the advantages that go to make up a promising, pleasant and fruitful country.

We have, I think, as fine an arrangement of water-works as exists in the State; an excellent system of telephone, and if you give us another visit, I promise you we shall also be well lighted, as about the only thing we need now, is the electric light. We can make you, I think, the best buggy that is made in the United States; and we also take

care of the Ills of Life. We are extensively engaged in the manufacture of patent medicines. We are also looking after your health. (Laughter).

We take great pride in our public schools. We believe that we have the best public schools in the State of Ohio.

Our welfare and prosperity are mainly due to the industry, energy and liberality of our inhabitants. Again, in behalf of our town and county, I extend to the State Horticultural Society, a most hearty welcome. (Applause.)

President Tryon: Mr. N. H. Albaugh will now make some remarks on behalf of the Miami County Horticultural Society.

Mr. Albaugh responded as follows:

Mr. President, Ladies and Gentlemen: To the most of you, my face is not an unfamiliar one in gatherings of this kind; and when I invited this Society, and urged them to hold their annual meeting in our little town, I did not think, at that time, what I now know, and what you now so well know, that it should be as ably represented to you to-night as it has been by the mayor of our town. [Applause.]

He has not told you all the attractions nor all the beauties of this little city. He has told you, however, that in this building we have one of the finest structures for the administration of justice in the State of Ohio, and that we feel proud of it, and that we are able to pay for it. I am glad they did not put the public hall in the third story, as is usual, where we would have to climb to it.

It is usual, in worldly life, when a daughter arrives at a suitable age, to have a special gathering and a bringing-out, so to speak, into society, of that member of the family; and so this is the "bringing-out" of the 16-year-old daughter of the State Horticultural Society, whose christian name is "Miami." She is among the youngest of the daughters of this esteemed household, and I can truly say that, like the daughters who reside and reign in this beautiful Miami valley, she is one of the fairest, as well as the most attractive of all the family. The rich alluvial lands of this Miami valley, and its scenery, are beautiful to the eye of the traveler, and I have no doubt the members of this Society, on their journey hither, when nearing this place, were impressed with the beauty of the surrounding country, and might have had thoughts arise in their minds of the paradise of old, of which this valley is a fitting sequel. This is the first time that the State Horticultural Society, or any other important State meeting, has been held here, and I can truthfully say that the Miami County Horticultural Society appreciates your presence, and shall do all in their power to make your stay pleasant.

From ancient Greece radiated to all parts of the world her learning and letters, and made their impress broad and deep upon all nations of the earth. In like manner, the festive tree-agent, from Troy, Ohio, has perambulated and permeated every quarter of the known, civilized globe. And were it not that the majority of them are obese and sleek fellows, I have no doubt that they would make a canvass in their business among the cannibals of the Fiji Islands. The stories they sometimes tell to the bucolic citizen, although somewhat painted, have, nevertheless, been a cause of imbuing thousands of land-owners with a thirst for horticultural pursuits, and have caused the planting of millions of trees, plants and flowers, where, before their advent, all was a barren waste, and thus they have been the cause of immeasurable good to our whole land. It is but meet and proper that this Society, old and dignified as it is, should hold a session in this town, and by its conservatism and accuracy, be able, where necessary, to tone down the size of fruits and the color of the flowers given by our perambulating fraternity, and bring all things within due bounds, to the great delectation of planter, seller and buyer. I can insure the members of this Society from abroad, that they will be the lions of this little city, while they are here; that the best the city affords shall be at their service; that our citizens will give their strict attention, and listen to every word said here in the

meeting, and appropriate all new and valuable information that you may be able to give them; and when your meeting here shall close, they will bid you "God speed," and be glad of your coming back, in any future year. I can also say that your meeting here has greatly encouraged your young daughter in Horticulture, the blue-eyed "Miami," and with a few more lessons from the good matron of the household, she may, in time, even be able to set up housekeeping on her own account, in a way that will reflect credit and honor to her maternal parent.

Ladies and gentlemen of the Society, we thank you most earnestly for your condescension in holding your meeting here this year, and rest assured your horticultural labors among us shall not go unrewarded.

President Tryon: It gives me great pleasure to announce that Professor W. R. Lazenby, of the Ohio State University, will respond. I take pleasure in introducing him.

Professor Lazenby: It is related of Wendell Phillips, the renowned orator, that once, when traveling in Ireland, he made a visit to Dublin. He visited a building, while there, and did not know exactly what institution he was in, until, all at once, a door was thrown open, and he found himself before an audience of criminals. It was the Penitentiary;—and in the confusion of the moment, he said, "My dear friends, I am glad to see so many of you here." (Laughter.)

I am sure I cannot express in suitable words, our appreciation of the courteous and kindly welcome we have received. When the members of the Miami County Horticultural Society invited us to come to Troy, I felt, as others may have done also, that this town was so called on account of its likeness to the ancient Troy. I have been in Dublin, and in London, but this is the first time I have been in Troy, and it has been stated, as some of you will recall, that the ancient Troy was built by Alexander the Great, and that during the construction of those walls, hundreds of men were employed, and only the costliest of materials were used. But modern Troy was not built in that way; it was built by the industry of its inhabitants.

As we all remember, Greece and Sparta laid siege to Troy for ten years, in order to regain Helen, the noted beauty of her town. We have been given a grand description of that ancient city, but I doubt if it had any building which, in point of grace or magnificence, would equal the building we are in to-night. Now, I think we feel, as Horticulturists, that we are doing something to add to the good of the country and the well-being of society, and not only that, but we feel that we are doing something to develop men. The influence of occupation has a great deal to do with character. We show, in our profession, that it is in no way contracted. When we look at our worthy President, we all know him to be always good-natured, warm-hearted and cheerful, and always carrying with him a kind word for everyone. When we look at our venerable Secretary, whose countenance we so love to meet, we can perceive that, although the hand of Time has touched his brow, and Nature has whitened his locks, he is not changed in heart or in disposition. He is yet the same efficient, willing, and amiable worker.

A minister once asked a boy if his father was a Christian, and the boy said, "yes, but he don't work at it much." (Laughter.) Now, we are horticulturists; and we work at it.

An Irishman was once passing along the street, and his attention was attracted by a fine building, and he stopped and looked at it very intently. The owner of the building became somewhat annoyed at his standing there, and he opened the window and said, "Go along, what are you doing there; do you think this is a church?" "Indeed," said Pat, "I did think it was, until I saw the devil sticking his head out of the window." (Laughter.)

I am very glad, in behalf of the Ohio State Horticultural Society, to accept your-

welcome, and trust that our meeting here together, will be doubly beneficial. We know that when mind comes in contact with mind, good always follows.

We need something that will stir us up, and which will be a sort of awakening, and I think this meeting will be one very advantageous to us all. I wish you all "God speed." (Applause).

The President's Annual Address is next in order.

President Tryon: The night-before-last I undertook to look over what I had written, and before I had read half a dozen pages, I fell asleep. The thought comes to me, that if I had not written anything which would interest myself enough to keep my eyes open, I could hardly expect others to be sufficiently interested to keep awake. So you can just adjust yourselves to the situation. (Laughter).

PRESIDENT H. G. TRYON'S ANNUAL ADDRESS.

Members of the Ohio State Horticultural Society:

As a prelude to the annual address, I can but tender you my profound acknowledgments and sincere thanks for the confidence you have reposed in me. I accept this mark of your respect, with a humble desire to do all in my power to promote the interests of the Society, and to perform the duties of the office acceptably. Able and illustrious gentlemen have preceded me; scientific, scholarly, eloquent, and everywhere highly respected; men of State and National reputation, whose counsels were sought far and near, and whose advice was treasured. It has been, and still would be, could it have been so ordained, my greatest pleasure to sit under their administration and teaching, a willing listener and pupil.

I cannot, and you do not expect me to fill the chair they have vacated, as it was filled by them. It shall be my endeavor, however, always to appreciate this mark of your confidence, coming as it does from a body so intelligent; unsurpassed, as I believe, in ability, breadth of experience and practical knowledge in all that pertains to the varied branches of horticulture, by any similar organization, anywhere. No honor could give me greater pleasure. Again, I thank you.

However much you may miss the literary attainments, the scientific research, the great executive ability and eloquence of the worthy men who have preceded me, it becomes me as best I may, to see that the dignity and the value to the people of the State, of this organization, be maintained. I feel that it is incumbent upon the president of this Society, to see that a stirring interest in our work of experienced and observing horticulturists is kept alive, and increased, from year to year.

Though in no sense beggars, we have, in a small degree, become the recipients of the bounty of the tax-payers of the State, and we are thus placed under obligations to give them value received. In accepting this bounty, we have assumed the responsibility of becoming the educators of the people in all that pertains to their interests, as growers of fruit for commerce, local markets, or their own family use, as well as for the improvement of their homes and home surroundings.

It is true that we have given more immediate and extended attention to fruits, because in them we have seen a more ready compensation; but we have not been unmindful of the garden nor the landscape, nor of that cultivation which makes the farmer's home beautiful, attractive and enjoyable; and which binds the children to the country, and stimulates that mental culture which makes truly intelligent people, and life worth living, and elevates the tiller of the soil to a fuller, better, and brighter manhood. On every hand and at every turn may be seen the results of our labor.

Without this, and kindred organizations, each grower of trees, plants and fruit, would depend almost wholly on his own resources and experiments, or upon superannuated literature; struggling on without adequate knowledge, gathering, perhaps, important facts by processes slow and tedious, to be utilized for a brief period and then buried with the possessor, or at least confined to a limited number in a given community.

It is not surprising, taking human nature into account, that men thus acting for themselves and by themselves, either follow in a beaten path, or become grasping, reticent of their knowledge, wise in their own conceits, and jealous lest their neighbors profit by their dearly acquired wisdom. If, by chance, persons thus fortified, are brought into a gathering of this character, it is apparently with a feeling that there is nothing for them to learn. They seem to be in just that mental condition to neither receive nor impart knowledge. We can but rejoice when the scales cleave from their eyes by being brought into contact with those who have acquired a wealth of accurate knowledge by extensive reading, by comparing notes with intelligent and practical men, and putting into daily use what they have learned.

The former class are purely selfish, and their acts are unworthy of men desiring the best interests of society; the latter are philanthropists; having no secrets, but spreading broadcast, accurate knowledge free as air to every seeker.

Prior to the forming of this organization, and within easy remembrance of most of us, it was almost impossible to get trustworthy information as to successful varieties of any of the fruits not generally cultivated,—of strawberries, raspberries, blackberries or grapes. People everywhere were made the dupes of agents who took advantage of their ignorance to palm off worthless stock, at fancy prices. Thousands of dollars, I daresay, have been taken out of my own little county, for trees and plants that were worse than useless, because they encumbered the ground and cost time, labor and delay without producing anything of value. The same thing could be repeated over and over again, were it not for the information disseminated by gatherings like this.

Largely through the influence and stimulus of Horticultural Societies, able and ingenious men are moved to continued experiments for producing better varieties of all the fruits, excellent in quality, beautiful in appearance, productive, hardy enough to endure the rigors of climate, adapted to all the different locations and all the varieties of soil. Thus new varieties are constantly brought out and put to the test the country over, by disinterested men who understand their business, and who, by large experience, are able to judge of the comparative merits and demerits of each, and who, through the reports of the societies and horticultural journals, publish the facts to the world without fear or favor. Thanks to the able and genial corps of managers and professors of the Ohio Experiment Station, who have so wisely and nobly come to our aid by carefully and systematically conducted experiments in different locations and on different varieties of soil.

It is greatly to the credit of our largest and best nurserymen that they have put their shoulders to the wheel in this work from the beginning, determined to discard that which is least valuable, and supply every thing to the public which has true merit. To-day, no man who plants fruit in Ohio, need proceed blindly, but can readily procure information which will enable him to purchase only such varieties as are adapted to his needs.

Besides giving to the people the very best, this valuable information secures them against the swindles of fraudulent dealers, and saves to them tens of thousands of dollars that would otherwise go into the pockets of schemers, and out of the State.

In nomenclature, the Society is doing an important work, and should coöperate still more vigorously with the American Horticultural and the National Pomological Societies to correct the multitude of synonyms, and establish a uniformity of names for the fruits over the whole country. Knowing the true name, we should adhere to it under all circumstances, and persistently correct those who use the synonyms in our hearing. Henceforth, let this be our rule, that in no case where it is possible to

arrive at the truth, shall any fruits be placed among the plate-exhibits at our fairs, unless correctly named. These exhibits should be standard educators of the people; and it is the aim and end of the Society, to see that these object-lessons are made up, so far as possible, in a truthful manner.

In accordance with a resolution of the National Pomological Society, it is our desire and endeavor to simplify names to plain and agreeable English. Thus, Baldwin, Greening, Concord, Delaware, Wilson, Crescent, Souhegan, Gregg, Cuthbert, Erie, Taylor, etc., are the simple, unassuming, and agreeable forms to which we hold, never yielding our consent to such boastful and disagreeable cognomens as Big Bob, Monstrous Free, or Stump the World.

The Society has been a chief factor in general dissemination of correct principles of cultivation of the small fruits. Comparatively few years have elapsed since berries were extensively cultivated either for home use or for market. People depended on the fields, frequently of their neighbors, for a meager supply of strawberries, raspberries and blackberries. Farmers and horticulturists everywhere were ignorant of any successful methods of cultivation, and would have remained so to this day, had it not been for the discussions in this and kindred bodies, of every item that enters into the management of the fruit-garden, including location, form, drainage, fertilization, planting, tillage, pruning, and all that pertains to success. One fact after another has been added. A comparison of the manner of management has continually brought out improved methods, which have been freely published for the benefit of all. The farmer who commences a fruit-garden to-day, may start from the first, with a full, theoretical knowledge of all the essential facts necessary in its management.

The improvements in the cultivation and training of vineyards have been even more marked and important than in other fruits, because earlier attention was drawn to their wonderful products for commercial purposes. Ohio can never repay the debt it owes such men as Ernst Bateham, Warder, Campbell, Kirtland, Elliot, Springer, Dunham, Storrs and others, who set on foot the movement which led to the organization of this Society, and laid the foundation for the growth and dissemination of this invaluable knowledge.

Thus, through the persevering labor of members of this Society, have the people of Ohio been taught to appreciate that most wonderful of all her products, fruit; instructed in the selection of varieties; where, how and when to plant, how to cultivate, prune and train; best methods of marketing, storing and preserving fruit; in ornamental trees, shrubs and flowers; management of the lawn, road-side tree-planting, and, above all, have they been stimulated to better work, and better results in all that pertains to horticulture, agriculture, and education, and to seek more of the comforts of home-life, and the luxuries of our genial climate and bountiful soil.

Undoubtedly there are those who will say that the claims here set forth are a myth; that all this is mere talk, without foundation in fact. Possibly, they fancy that all this important knowledge has come to the people, and themselves in particular, intuitively. A practical example of this kind was recently brought to my attention in this way. An agent for a prominent horticultural journal called on an extensive fruit-grower to solicit his subscription for his paper. The reply was, that "the paper would be of no use" to him. "Why," said he, "there is A., B. and C., who take all these papers, and attend all these horticultural meetings, and," said he, "I can beat all of them." This man is remarkable for his energy, keen observation, inquisitiveness and acquisitiveness; and while he seems to have fancied that he was above and ahead of outside instruction, I know, of my personal knowledge, that he is a close imitator; that he received his first inspiration for growing fruit, from the identical A., B. and C. whom he could beat; that from them, and others like them, who read the papers and attend the horticultural meetings, he drew his information as to varieties and all the main particulars which have led to his success. Without realizing it, he had the full benefit of the knowledge inspired by the Society and gained by men who had by experiments, often disastrous, made the subject a

life-long study, for the very best there is in it. I believe investigation would demonstrate, that wherever the growing of peaches, pears, grapes or berries, for commercial or other purposes, has become prominent, it can be traced directly or indirectly to the light disseminated by horticultural organizations.

Thus, our labor is none the less important, if not appreciated; and whether appreciated or not, extends in its effects to the remotest corners of the commonwealth, and has an influence for good, beyond our power to realize.

A forcible illustration of the beneficial and even revolutionizing effects of an annual conference of intelligent men engaged in a common calling and having identical interests, has been demonstrated in many ways since the organization of Farmers' Institutes in this and other States. Ohio, I fear, will never repay Dr. Chamberlain as she ought, for the impetus he gave to agriculture and general intelligence, by working up this grand idea of annual lectures and discussions among farmers, and for his indomitable energy and perseverance in putting the system on a firm basis.

Many years ago, some of the fancy farmers of the eastern states started an idea long-practiced in the old countries, of preserving food for cattle in a green state. In spite of a general discussion in the papers, and volumes published on the subject, the whole thing fell flat and remained dormant. But for the agency of the Institutes in this and western states, this important system for preserving a winter supply of succulent food, cheap, digestible and indispensable to the growth of young stock in winter, would still have remained practically unknown. To-day, theoretical knowledge of its working is general, and practical knowledge is quite common over the whole country. Through sharp discussions for and against, at the Institutes, farmers have been impelled to experiments; results have been compared, and by this means important discoveries and improvements have been made in the silo, and the manner of preserving silage, until it has undoubtedly become the cheapest and one of the most available forms of preserving food for stock. Thus, through this tangible and intelligent means of interchange of thought, aided by the press, is a rapid revolution in the system of feeding being wrought, which promises the most important results to that important class, the farmers.

As I have shown, in Horticulture, we have accomplished much, but there is work ahead. There is no reason why we should not continue to persevere, but rather incentives to advanced steps. Younger men should be induced to take hold of this work now, to give it the impulse of early manhood and in earlier life to become well schooled in every branch, that they may secure for themselves and others the very best there is in this important industry, and that no backward steps be taken.

We furnish to the markets a wholesome and important article of diet. Nature's bounty, and Nature's remedy for a thousand ills, ready for the palate at sight, in variety to suit all seasons and all tastes, pleasing to the eye and often as beautiful as the lily of the valley, a luxury that no millionaire can adulterate or counterfeit; of itself above suspicion of fraud. Our labor is to maintain it at its best in all its features, to improve its varieties, to make it as common to every farmer's home as wheat, corn, or potatoes, and the knowledge of its nomenclature and culture as thorough and as general.

To this end, we ought to take full charge of all exhibits of fruit at our State and county fairs; not as individuals, with plans to be changed at every whim or fancy; but as a body to secure by discussion and action here, the best form for the exhibition, to make it both attractive and instructive; an easy object-lesson, permanent and uniform, at all our fairs.

The Centennial exhibit, in many instances, demonstrated the importance of employing experts, or making other improvements in the matter of awards, as the ignorance of some of the committees as to varieties, and consequent blunders, was too frequent for toleration.

A better plan would be to employ a committee of experts to assist in placing the fruit upon the tables, with power to correct labels, assign each variety to its proper place; and also nameless or unknown varieties to a table set apart for that purpose.

I would recommend that such committees be appointed by the Society for the State Fair in Columbus, and the Tri-State Fair in Toledo, and that their expenses be paid by the Society.

A few years since, by action of the Society, the Ad interim Committee was increased to ten members. Those should be so distributed as to represent as fairly as possible, all sections of the State. The question of favoritism in their selection, as I have no doubt it is, should be entirely ignored by every member taking part in their election. In fairness, yet with an eye to fitness, it is proper to change the membership often, if not annually. I believe this course would add interest, and enlarge the active membership of the Society.

In addition to reporting on the varied success of the fruits old and new, and the apparent causes of productiveness and failure, I would suggest that they be authorized to attend meetings of neighboring county societies, for mutual conference and instruction, and for the development of new facts.

The question as to the annual appropriation by the General Assembly for carrying on this work, is one that should be considered here. One thing is certain, we shall not get more than we ask for, nor should we ask for more than we can use for the benefit of the people. At least a thousand dollars might be added, for work by members of the Society at Farmers' Institutes. This is a direct and practical way of getting the ear of the people.

It should be a part of the business of every member, to urge the importance of nominating and electing men to office who are level-headed and intuitively interested in the welfare of the people; not politicians, but unselfish men, who have the good sense to see that "they best serve themselves and their party, when they serve the people best." I speak of this in this connection because of the grudging manner in which appropriations are made by our statesmen for the benefit of agriculture and horticulture, and the lavish appropriations often made for unworthy objects.

The Wisconsin legislature annually appropriates a sum equal to the full requirements of the managers of their Farmers' Institutes, and the tax-payers feel that no money is so well expended. The Ohio General Assembly appropriated last year for "the encouragement of agriculture," including the salaries of the secretary, assistant secretary, and clerks of the State Board, collecting and compiling crop reports, lectures at Farmers' Institutes, office expenses, etc., \$6,500. The usual annual appropriation for the Horticultural Society is \$1,000; for the year now closing—nothing. The appropriation for that organization known as the Ohio National Guard, for three-fourths of which there can be no possible use, or excuse, except on the barbarian theory, that "in time of peace we should prepare for war," is not far from \$125,000 per annum. Those engaged in agriculture, are said to pay sixty-two per cent. of the tax, or \$77,500 of this snug little sum, and for what possible benefit to them? \$125,000 per annum for the encouragement of a military spirit, and the vices, and waste of valuable time that go hand in hand with it. For the encouragement of agriculture and horticulture, \$7,500 per annum. To keep up those "slow coaches," the canals of the State, we have given them the past year all their earnings, and \$109,000. One hundred and two thousand dollars more, than for the great fundamental industry of the State. The cost of litigation, in which farmers and horticulturists have but little interest, except in paying the bills, is another burden which should be modified or turned over to the lawyers who stimulate it. To work reforms in these abuses, is not exactly in the line of horticulture; but it is in the line of horticulturists.

Mr. John Little, of Ontario, Canada, in an after-dinner speech at a meeting of the American Horticultural Society, said that "he put horticulture and religion together," and "was sorry he had not commenced earlier in life."

Now I would suggest, that we not only put our horticulture and religion together, but that we add politics, at least until we get a fair system of taxation, and a fair encouragement of our leading industries.

Experiments made by members of this and kindred Societies for the last few years, in spraying apple and pear trees with arsenical poisons for the destruction of the codling-moth is, in my opinion, meeting with paying success. The improved methods of application have been of great assistance in this work. No doubt still further improvements will be made. There is no doubt great liability to damage the foliage in application, hence it is important to reduce the poison to the lowest possible amount that will be efficient. Since spraying our fruit, we have also been damaged less by the curculio than for many years previous, and the indications are, that the poison is a check to this pest also. I wish I might be able to speak of favorable or successful efforts to master those maladies, pear blight, peach yellows, and grape-rot.

As one great source of regret to the Society, I will mention that our able Secretary proposes to decline a re-election. He has served us long and nobly. Always courteous and obliging, full and explicit in correspondence, he has won the highest esteem of all. In penmanship rapid and of rare perfection, and with a thorough understanding of every subject discussed, scientific and scholarly; an expert as a proof-reader, untiring in efforts to collect the pith and valuable matter from others, his reports have been remarkable for fullness, accuracy, perfection in type and form, unsurpassed by any similar work. If the decision is final, it will be accepted, not from any wish or willingness of ours, but with the most sincere regret. I believe I speak the unanimous sentiment of the Society, when I express the hope that it will not be final.

In the course of human events, we all have our sorrows, deep and abiding. It becomes us, as best we may, to modify our griefs by a more thorough devotion to the duties which are before us, ever thankful to the great power which controls all for the manifold blessings received.

Accept congratulations for the noble work you have so well done. With a most sincere and earnest desire for the pre-eminent success and happiness of you all as individuals, and the hope and belief that your labors for the good of all the people, will be better appreciated, and enlarged and increased in lasting benefits, as the years go by, I bid you hearty, God speed.

The President announced that Mr. W. H. Ragan, of Indiana, the Secretary of the American Horticultural Society, was present, and the next thing in order would be a paper from him.

Mr. Ragan then read the following paper:

COMPARATIVE GROWTH OF FOREIGN AND NATIVE TREES AND PLANTS.

BY W. H. RAGAN, OF INDIANA.

Certain peculiar characteristics belong to the peoples, animals and plants of the several continents and geographical subdivisions of the earth's surface. Whether these dissimilarities are due to climate or soil, or to other local causes, are questions worthy of one more highly versed in the mysteries of science than is the writer; yet such are the facts.

Thus the stalwart Patagonian differs, morally, physically and mentally, as well as in habits and manners, from his swarthy relations of South Africa or of Australia; while the native of Eastern Asia is essentially different from the European, and he from the untamed tribes of North America.

Likewise the animals and birds and trees and plants, although closely related in genera and species, are found to differ from each other, as they are collected from the various quarters of our globe. And these differences are not successfully overcome, even by removals from their native habitats or artificial conditions and surroundings which may be enforced by accident or design on the part of man, in his efforts to obey the command to go forth and subdue the earth.

But civilized man has found, by long and patient experience, that certain animals and certain plants yield more surely and more effectually to the domesticating process—to training and culture, than do others. And this fact extends upward throughout the whole scale of animal and vegetable life, to man himself, where exists certain docile and other wild and ferocious races, upon whom the civilizing processes have widely varying results. As an illustration of this, we will take the dog, and his near relative, the wolf; the one an associate and companion of man, and the other as wild and ferocious as when first coming forth from the Ark, after that eventful voyage which preserved only the progenitors of his race. And again, the horse and the zebra; the former everywhere the faithful, obedient, educated and even intelligent servant and companion of man, and the latter still wild and vicious, utterly refusing to yield to the restraints of domestic life.

Thus we may study the natural history of animal and plant-life, only to find that certain species are susceptible of culture, and what we are pleased to call improvement, while others persistently rebel against the restraints of civilization and domestication.

Those species which readily yield to man's influence, and which are susceptible of improvement and culture, and which may thus be made to contribute to his comfort and happiness, may be familiarly classed as *tamable species*. On these accounts, they have been carried, by man, in his migrations from one country and continent to another, until we now have and enjoy, as familiar and constant companions, both domestic animals and plants, drawn from every temperate climate and country of the globe. The older, and, as a consequence, the more thoroughly domesticated species—I should probably say the first known to civilized man—are, of course, those species brought with him in his migrations from the old world to this comparatively newer hemisphere, whose fauna and flora were unknown, except to savages and barbarians, prior to the discovery of America.

Here, then (in America), the process of subduing wild nature is only in its infancy. Every species of America had enjoyed perfect unrestraint, following, without interruption or molestation, the will of its nature for centuries after its old-world cousin, if it should have one, had been brought under the dominion of man. Thus it may not be a matter of surprise to find, through a careful comparison of related species of foreign and native origin, that there should be found to exist certain perceptible differences in natural habits, etc. It is, therefore, to the result of some personal observations in the line of comparisons in this direction, that I would now call your attention. As a result of these comparisons, it may be very clearly shown that the wild, untamed, natural habit of American species still manifests itself, when the plant, tree or vine is placed side by side with its foreign relative. Almost, or quite without exception, as far as my observations have extended, the American species will be found, if not stronger and more vigorous, very probably a more straggling grower than its exotic relative.

A COMPARISON OF FOREIGN AND NATIVE SPECIES.

We will begin our illustration, by referring to the old-world grape, *Vitis Vinifera* of the botanist, which has been the domestic companion of civilized man from the earliest history of the race. Like the horse, the dog, and other domestic animals, the *Vitis Vinifera*, from its long association, has become thoroughly subservient to man's uses and purposes. He may train it almost as he will, and yet it patiently submits, always yielding its precious treasure in the season of harvest. While it may be strong and vigorous, it is yet comparatively compact in its habits of growth, seemingly preferring to ramble near the surface of the ground rather than to mount, as will an American species, to the topmost branch or crag within its reach. Yet again, the old-world grape may be

pruned to a mere stump, as a result of its long discipline, if not of its natural tame and domestic habit, while our American grapes will utterly rebel and refuse to yield fruit, if not to live, when subjected to such a rigid regime.

The American wild-cherry (*Prunus Serotina*) is a much bolder, straggling grower than its European congener, the domestic cherry (*Cerasus Sylvestris*), or even its more nearly allied foreign relative, the *C. Mahaleb*. Our native, wild plums (*Prunus Chicasa* and *P. Americana*) are each bolder and less symmetrical in their habits of growth than the European species, *P. domestica*.

The native gooseberry (*Ribes hirtellum*) and the native wild currant (*Ribes floridum*) are stronger and more robust in habits, than are the domestic gooseberry of Europe, (*R. grossularia*), or the introduced garden currant, (*R. rubrum*).

None of the varieties of foreign raspberries, (*Rubus Idaeus*), will compare, in boldness of growth and rambling habits, with our native species, *R. Strigosus* or *R. Occidentalis*.

The native strawberry, (*Fragaria Virginiana*), unquestionably furnishes some of the most rampant growers belonging to the genus.

In the genus *Pyrus*, (the pear and apple), we have but few native examples for comparison. The native wild crab (*P. Coronaria*), however, while it may not be more vigorous than is *P. Malus*, the cultivated apple from Europe, it is probably, when they are each left to themselves, less symmetrical in its form of growth.

The above practically completes the list of comparisons, so far as our fruit-bearing species of native and introduced trees, shrubs and plants may be of interest; but there is yet a large list, mainly of ornamental and useful trees, in which the same general results may be reached by investigation.

Perhaps none of the introduced roses will compare with some of the native species in luxuriance of growth. Probably none of the foreign junipers are so loose and straggling in habits of growth as the common red cedar (*Juniperus Virginiana*). When we compare the several introduced species of *Arborvitae* (*Thuja*) with our native species (*T. Occidentalis*) we find the same general results are obtained.

The American Larch or Tamarack (*Larix Americana*) is not stronger, but certainly less compact in its form than is *L. Europea*, the introduced species. The Scotch and Austrian pines (*Pinus Sylvestris* and *P. Austriaca*) are each bold, strong growers, but yet short-jointed and compact in habit, as compared with *P. resinosa*, our northern Red pine, or *P. Strobus*, the majestic White pine of Michigan and Canada. The Balsam fir (*Abies balsamea*), indigenous to the northern borders of the United States, is a much more aspiring tree than the the noted silver fir (*A. pectinata*) of Europe. The Lombardy poplar, (*Populus dilatata*), is much more symmetrical and compact in its form and less robust in habit, than either of our well-known indigenous species. *Tilia Americana*, the linden or basswood of our forests, differs essentially from its compact-growing European cousin, *T. Europea*. The Norway Maple, (*Acer platanoides*), though a vigorous, strong grower, assumes, without artificial aid or training, a low, compact and beautiful form, very readily distinguishable, on these accounts, from our native maples. The native ashes (*Fraxinus*) of the various species, are, perhaps, without exception, more slender and taller growing trees than their European cousin, *F. excelsa*. The horse-chestnut, (*Aesculus hippocastanum*) is a more compact, and yet a more vigorous grower than our native buckeye (*A. Glabra*).

I have now, doubtless, presented a sufficient number of examples to place this interesting study before your minds in such a way as to lead to further inquiry and investigation, for I have, by no means, exhausted the field of observation. Indeed, my own observations have been very limited, and I have only presented such comparisons as have come within my memory as I have hastily penned this article. I hope, however, in this paper, to be able to draw the attention of scientists to such peculiarities as may be found to exist, in the further investigation of the subject here introduced.

The President announced a paper by Mr. E. H. Cushman, which would close the business of the evening.

Mr. Cushman: I would like to say that this paper, in the writing of it, did not have the same effect on me, that the reading of the President's paper had on him; for I could not go to sleep until after 2 o'clock, when I first undertook to write it. (Laughter).

THE RELATION OF REFRIGERATION TO HORTICULTURE, AND ITS BEARING ON COMMERCIAL FRUIT-GROWING.

BY E. H. CUSHMAN, OF EUCLID.

It has long been known that the effect of cold was to retard decay; that frozen meat could be preserved indefinitely in that condition; that by a steady, cold atmosphere, fruits and vegetables could be kept far beyond their season, and sold at advanced prices. Especially has this been the case with apples, pears, grapes, onions and potatoes. It is also known that two other conditions are necessary to success, notably, dryness of atmosphere, and absence of light. Of the last two conditions, dampness has been the most difficult to eradicate. Especially has this been the case in all systems where ice was used as the cooling factor. The preservation of an equal low temperature during the cold months of our northern climate, in houses especially built for this purpose, are well known. The use of ice as a cheap factor for maintaining a temperature near the freezing point in warm weather, is quite well understood; but in this method, there is always the moisture to contend with, and it has never been perfectly obviated, consequently a great deal of mold and decay take place. By the ice method you cannot go below the freezing point, and therefore it is of but little value in preserving fresh meats for any length of time.

The vast, commercial movement of our perishable food-products has created a demand for storage where any temperature, down to zero, can be steadily maintained, together with a dry atmosphere, to tide over a glut of perishable products, and save producers and holders from ruinously low prices at such times.

To reach this result, the inventive genius of ours and other countries have been at work for the past fifteen years.

The first ice-machines were very expensive, dangerous and complicated, and could only be used at a profit in warm climates far from nature's supply of cold. The principal chemicals that have been employed in the various ice-machines are ether, sulphurous and carbonate anhydride, one of the naphthas, and ammonia. Of these, ammonia has been the most successfully used, and to-day forms the basis of the most scientific, practical and economical method before the public. It is of this process, and what it is doing, and can, and will do, that I wish to bring before you.

GENERAL USE.

The Corning Refrigerating Warehouse Company is equipped with an apparatus to produce the new freezing-agent, anhydrous ammonia, which they use in reducing the temperature of their storage rooms of 260,000 cubic feet capacity. The machinery, to a casual observer, appears to be a steam boiler and a complicated system of pipes and stills. These are in a separate room from the storage boxes, and are used to convert the commercial ammonia, of 26° Baume, to anhydrous ammonia, which, in its natural state, is a gas of about 120 pounds pressure. This gas, by pressure, is liquified, and in this state, it is ready for its work of refrigeration. The extreme degree of cold which this ammonia-water can produce, was very forcibly impressed upon my mind at the time I visited the works. Mr. Iddings, the superintendent, drew about a gill of the liquid from a still into a tumbler, and passed the glass to me. I took it between my thumb and

finger, just above the liquid, and held it for a moment only. It gave the same sensation that burning would. I returned the glass to Mr. Iddings, and we passed into the laboratory. The bulb of a Fahrenheit mercurial thermometer, scaled to 40° below zero, was placed in the ammonia. The mercury immediately dropped to the bulb and was frozen. The thermometer was withdrawn. A tin basin, with about half a pint of water, was procured, and the glass containing the ammonia, was placed in it. The mercury was warmed to 60°, and again placed in the ammonia. This time, the mercury dropped to zero in three seconds, and in eleven seconds more, was again in the bulb. This showed a drop of 100° in fourteen seconds by the watch, and by this illustration, we can form some idea of what can be accomplished by anhydrous ammonia. The water began to congeal around the glass the instant it was placed in the basin, and the tick of Jack Frost was easily heard.

During all this time, the liquid ammonia was seen passing off in vapor or gas, which is its natural state. We left the tumbler standing for about a half hour. On our return, we found the ammonia had evaporated and left the tumbler empty, with about an inch of ice surrounding it. The liquid ammonia is passed through a system of pipes, with which the storage boxes are fitted, and in its efforts to regain its gaseous form by evaporation and expansion, it absorbs heat, the moisture condenses in frost on the pipes, and a perfect refrigeration is produced. The ammonia gas, as it passes from the refrigerator pipes, is condensed into the liquid form with no waste, and it is then ready to again perform its circle of duty.

The refrigerating boxes range in size from 9x15 to 15x35 feet by 8 feet. The walls are 10½ inches thick, consisting of three air spaces, and are constructed of studding, matched stuff and paper. Around the sides and ends of these boxes, are 1½-inch iron pipes. The amount of pipe per box varies from 1,000 to 1,500 feet, according to the degrees of cold required,—1 foot of pipe to nine of air space.

These boxes are constructed in ranks, with alley-ways between. On the outside at each door, is a thermometer and a check-card for registering the temperature of the box. The degrees of cold can be gauged in the different apartments suitable to preserving the contents of the rooms, and the ammonia can be turned on or off the same as steam or gas, and regulated as may be required, without the least perceptible odor.

The Company guarantee to keep frozen, for any length of time, all kinds of meats, fish, and game, and to keep at any desired temperature, eggs, butter, cheese and fruits. They say in their circular, that "This system of cold storage is in successful operation in St. Louis, Nashville, Atlanta, Chicago, and Kansas City, and the time is not far distant when this system of refrigeration will entirely supersede ice."

As to what the Company has done for others, the testimonials will show, and more of the same kind could be readily obtained.

At the time of my visit, December 5th, the Company had in storage, eggs, butter, cheese, apples, onions, grapes, pears, fish, meats, poultry and game.

Seventy dozen eggs, put in storage August 13th, and taken out November 23d (over three months), were candled, and only two spoiled ones were detected. Such a result is very flattering for the system, and all hens should take due warning, that strikes in cold weather will have no effect on the winter egg-market in the future.

Butter that is soft and oily, when placed in the freezing boxes, settles down to a firm basis, and sells for a good article, and there is a possibility that winter dairying will not be as booming as at present.

For keeping good cheese, this method seems to be perfect, and for animated cheese it is a marvel of perfection. Under a freezing temperature the cheese assumes a tranquil state, and is soon in shape to meet the market at good prices.

For pears it is not to be excelled. I saw as handsome Flemish Beauties as one could wish to look at, that had been in storage three months, and I was informed that other varieties keep equally as well. Apples were in store, but had not been in a sufficient length of time for a test.

Catawba grapes, placed in the box September 10th, were in excellent preservation. The berries were plump and fresh, and the stems were as green as on the day they were taken from the vines. This fruit, 15 tons, was placed in the box under very adverse conditions. The baskets were green, and at the time the grapes were gathered the weather was very damp; after the fruit was placed in the box, the air resembled dense fog. Just here comes in the strong points of this system, which are impossible with ice. The pipes condensed the moisture in the form of frost, and in three days, the atmosphere was dry and clear.

Fish, poultry and meat are placed in a room fitted for maintaining a specially low temperature, where they are frozen and then removed to other boxes, where they are retained until wanted. This box will freeze six tons every ten hours. This hard freezing is one of the very prominent features of the system, and no doubt time and experiment will prove that very many products, that in their natural condition are soon rendered unfit for food, will be preserved for consumption in the fresh state.

The Company received a number of sacks of dried peaches, which were placed in storage during warm weather, with the very best results. These peaches were very damp and wormy when received, and when taken out they were like newly evaporated fruit.

If we let the idea take a firm hold upon us, that this is to be the canning establishment of the future, preserving in time of plenty and low prices for the time of scarcity and high prices, carrying the fruits of one season far into the next, many times saving from waste the bountiful harvest we are so frequently blest with; then we can readily conceive the vast revolution that will take place in our food commerce.

In eating your dinner at the public dining table of the future, you will not know whether your meat was slaughtered the day before, or last year; your fish may have been out of the water for months, and yet just as fresh as they were the day they were taken from their natural element. And so far as being able to determine what the season is by the fresh fruits and vegetables on the table, you will be entirely at sea. The epicure will have within his reach whatever he may wish, no matter what the season.

To enumerate all the innovations, both large and small, which will occur under a perfect system of refrigeration, would be an impossibility. It is certain that, as this anhydrous ammonia process becomes perfectly developed and better known, there will occur great changes and advantages to the produce traffic.

Mr. Cushman expressed a desire that all the members could see this machine and realize its effects as he had done.

Mr. Cushman said the natural temperature in the building was above 40°. He said also that the refrigerating rooms were odorless. In one case a pipe had burst which was filled with ammonia, but it had no effect upon butter stored in the room. Pears had not been kept longer than three months. Catawba grapes kept in this storage were fresh, and even the stems remained fresh and green.

President: Any further remarks on this paper? If not, the Chair will entertain a motion to adjourn.

On motion, the meeting adjourned to meet at 9 o'clock on Thursday morning.

THURSDAY MORNING, *December 13, 1889.*

The meeting was called to order, at 9 o'clock, by the President, H. G. Tryon, who said: A paper by Mr. F. R. Palmer is the first thing in order. It is a rather slim house for the paper to be read, and I think we might as well take up the next topic, the Apple. What new varieties have been sufficiently tested by any of the members to be recommended by the society.

Inquiry was made by W. W. Farnsworth about the Stark, and Grimes' Golden apples

F. R. Palmer said the Stark was a valuable and popular market apple; not very attractive in appearance, but of good size, fair quality, and a good keeper. A vigorous and healthy tree, and a good bearer. Grown most in Central Ohio.

The Grimes' Golden is one of our best winter apples; a good tree, and a good bearer, popular almost everywhere. Almost its only fault, was a tendency to fall too easily from the tree as it approached maturity. This could be measurably remedied by picking early. Neither of these could be called new varieties.

The President asked if any members had experience with the Wealthy apple.

N. Ohmer: I have grown the Wealthy, and find it an excellent apple, both for eating and cooking. I have no better apple in its season, which is late fall and early winter.

W. W. Farnsworth: The Wealthy is generally regarded as a winter apple, and is so in Minnesota, where it originated. In Ohio it is a late fall apple, and not a late keeper.

L. B. Pierce said the Wealthy seemed to fill a vacancy in Ohio, coming, as it did, between the fall and winter varieties, and its place was not supplied by any other. The King also brought a good price in the markets of Cleveland, Dayton, and other cities, coming in immediately after the Wealthy, as an early winter apple.

G. W. Trowbridge, of Hamilton county, said the Wealthy was about as early as the Alexander. Had generally proven satisfactory, but had shown some weakness in the tree in the way of a tendency to break at the forks of the limbs. The Yellow Transparent promised to be useful as an early apple, being earlier than the Early Harvest, as well as of good size and good quality for an early apple; much like the Early Harvest.

E. H. Cushman inquired for information about the Tetofsky. He had a few apples this year of that variety, which were very handsome, but only of medium size.

Mr. Pierce and Mr. Trowbridge both spoke rather disparagingly of the

Tetofsky. It was disposed to overbear to such an extent, that the apples were very small and of little use, and the tree would, if left to itself, bear itself to death in a few years.

Mr. Trowbridge spoke of the White Pippin as one of the most hardy and most profitable winter apples, of excellent quality, for his section of southern Ohio.

J. R. Hurst, of Ross county, had not found much profit in the White Pippin. The Ben Davis is the hardiest, most productive, and most salable apple in his orchard. The Stark, this year, was almost equal to the Ben Davis. It is as hardy a tree, and a better grower, and will keep nearly as long. Grimes' Golden, however, is a great favorite as an apple for general use.

President Tryon: How does the Grimes' Golden compare with the White Pippin?

J. A. Hurst: The White Pippin sells about as readily as the Grimes', but has not proven as profitable for us as a market variety.

President Tryon: We have with us Prof. Charles E. Thorne, and as he is obliged to go away in a short time, we would like to hear from him now; Mr. Thorne is a Director of the Experiment Station.

Mr. Thorne responded as follows:

MR. PRESIDENT: I thank you for this opportunity of appearing before the Ohio State Horticultural Society. You will all be glad to hear that I have not come with the intention of occupying your time with a long speech, but there are two features of the work of the Ohio Experiment Station about which I want to talk to you a very few minutes.

The first of them is, that in the work of our Station, the importance of Horticulture has been recognized, by the equipment of a Horticultural Department, with an independent outfit of land, buildings, teams and implements, and placing it in charge of a man whom we are not ashamed to send, as the Station's representative, to any meeting of American Horticulturists.

The study of problems in Horticulture, therefore, is to be made one of the leading features of our work; but I must remind you, that we cannot carry on this work alone. The Station must have the counsel, co-operation, and support of the horticulturists of Ohio, if it is to attain the full measure of success. I therefore ask you to help us with co-operation, suggestion and criticism, for it cannot but happen that some of our work will be justly subject to criticism. I hope, however, that in criticising, you will give us credit for an honest endeavor to serve truly the cause of Horticulture.

The second point, about which I would like to talk to you, is one which concerns you as farmers, rather than as specialists in any department of agriculture, and it is this:

If we go to any farmers' meeting in Ohio, and look around over the audience, we find it filled with gray heads. I see in this audience, more than the usual number of younger men, but even here, the proportion of gray heads is far too large. Now, this is all wrong. Farmers, where are your boys? Here, at such meetings as this, is where the young men ought to be, and would be, if they were beginning life with a proper appreciation of the life of the farm.

I know what the temptations are that beset the farmer's boy, for I have been that

boy myself. But I know, too, for I have been there also, that in a very great majority of cases the life of the city, which looks so tempting to the country boy, is nothing but a gilded sham! Now, we must see to it that our boys have a more correct understanding of this matter, and you especially, horticulturists of Ohio, representing, as you do, the most intelligent portion of the agricultural community, must exert your great influence in this work.

Let me make one or two suggestions respecting what may be done in this line, through the Experiment Station. In the first place, the Experiment Stations have opened, all at once, a new field of intellectual activity. They have opened a profession that offers as many opportunities and advantages as do any of the so-called learned professions, while the preparation for this profession is, at the same time, the best possible training for the making of a successful farmer.

Now, at our Station we not only want your support, your suggestions and your help, but we want you to send us your boys. We can not take many of them yet, but with the help of the University, we propose to make a beginning that will eventually, we hope, lead to the awakening in many of the bright farmer boys of Ohio, of a livelier interest in their fathers' calling, and will open to the poorest boy such an opportunity for obtaining an education in the principles and practice of scientific agriculture as few boys, rich or poor, have ever yet enjoyed.

Prof. W. R. Lazenby made some remarks upon the planting of trees, and also upon varieties of apples. He said that they had taken out the Rhode Island Greenings and left Baldwins, where it had been found necessary to remove trees on account of too close planting.

Leo Weltz, of Clinton county, said the Rhode Island Greening was not a satisfactory apple for southern Ohio, and could not be recommended for general use; as it was often injured by fungus. It was not a winter apple in his section.

N. Ohmer said Mr. Weltz was correct, according to his experience and observation.

L. B. Pierce, of Summit county, regarded it as an apple which deserves to be more planted in northern Ohio. Within his experience, he had found it both an excellent and profitable apple.

W. W. Farnsworth expressed similar views of the Rhode Island Greening for the northwestern part of the State.

Mr. Ohmer said it was much better adapted to the northern than the southern parts of the State.

Mr. J. R. Hurst, of Ross county: The Rhode Island Greening and the Baldwin were among the best apples in his orchard this year; but, as a rule, they have not heretofore, been profitable. I like the Greening, and consider it a good apple.

H. Cushing, of Cuyahoga: I would like to ask in reference to the dry-rot, which often appears under the skin of the Baldwin. Has the age of the tree anything to do with it? What has been the experience of the Society?

F. R. Palmer: With reference to the rot in the Baldwin, it is preva-

lent in our county, and I believe it is worse on young trees than older ones. The Rhode Island Greening is not generally profitable in Richland county, but on clay soil, it yields better. The Baldwin is better in New York and Michigan than in Ohio. The Ben Davis is better in the south than north. In Kansas, the Ben Davis is better, larger and finer than in Ohio—where I would not recommend it for family use.

N. Ohmer: We cannot advise planting any particular kind; only such as are known to succeed in your locality. An apple may do very well in certain localities, and do no good in another. There is no reason why we should recommend any particular apple. If a man asks me what to plant, I ask him what he has planted; and, if it has been satisfactory, I say, go ahead and plant it again. Twenty years ago, wishing to plant an apple-orchard, I asked for information as to the best apple for profit, long-keeping and good quality. I was recommended, by many, to plant Bentley's Sweet, as the apple which was making the most money; so I concluded to plant the whole orchard with this kind, if it was so good. I never got the cost of the trees from the apples. The bitter-rot got into them, and they were so worthless the trees had to be cut down. Every man ought to have sense enough to know what to plant, before he puts out an orchard.

Leo Weltz: Why did not you have?

W. W. Farnsworth said he had used lime and wood-ashes in his orchard as a fertilizer, and it had apparently had the effect of arresting and preventing the bitter-rot. He inquired what would be the effect of grafting the Baldwin upon the Duchess.

Professor Lazenby thought it would not be of any advantage; and, probably, no damage.

Geo. W. Trowbridge expressed similar views. He thought, also, this Society ought to be able to divide the State into geological sections, and to recommend fruits suitable for each; with lists which could be amended from time to time. If not practicable to divide geologically—then by districts.

B. F. Albaugh: Mr. Ohmer says, very properly, that we should find out what fruits do best in any locality before planting. For his own use, he should plant a variety of kinds; but for market, only such as had been found most profitable. Mr. Albaugh exhibited some fine specimens of Ben Davis and Rome Beauty, which were grown in Kentucky, and said these varieties also did well in the Miami Valley.

Timothy Munger, of Miami county, said the Rome Beauty was a good and profitable apple for southern Ohio. He would plant three varieties for profitable market apples: Maiden's Blush, Rome Beauty,

and Ben Davis. He would also call attention to the Lansingburgh apple, as promising to be useful.

Geo. W. Trowbridge would not recommend the Lansingburgh.

President Tryon: The first thing on the programme this morning, was a paper from Mr. F. R. Palmer; but was deferred until we had a rather better audience. We will now hear Mr. Palmer's paper:

COMMERCIAL FRUIT GROWING.

BY F. R. PALMER, MANSFIELD, OHIO.

No enterprise or pursuit is seemingly more neglected, or less understood by those who till the soil, than the science of Horticulture; and yet we feel quite safe in saying, that the raising of choice fruits for the market is a business in which want of skill and proper management will be as fatal to success as in almost any other business.

Where the soil and location are favorable, and where a good market can be conveniently reached, the growing of choice fruits for the market is a paying industry; but success depends very much on the practical knowledge and skill of the operator. He must not only be able to make a judicious selection of varieties adapted to his soil and particular locality, and the market for which they are grown, but he must understand and practice the proper mode of culture, and also that of gathering and marketing the fruit. No careless, slipshod mode of culture and marketing will ever result in success, in commercial fruit-growing. However much care you may exercise in the selection of varieties, unless intelligent culture be given, fruit growing will prove a failure on any soil, or under any circumstances. Neither can any one expect to farm extensively, and at the same time be a successful, commercial fruit-grower. Each business must receive its special care and attention.

We have seen many failures in fruit-growing, by farmers attempting to grow fruit for market, while their corn, wheat, oats, hay, etc., required more attention than they were able to give them, and the fruit failed for want of care, and want of skill in marketing.

Fruit-growers especially, should bear in mind that what is worth doing, is worth doing well. Neatness and good taste in arranging any kind of fruit for the market, adds much to the profit of the crop. I think it was T. B. Terry that said: Not one Ohio farmer in fifty, appears to know just how to grow and market potatoes, so as to get the most money out of them. Perhaps this would apply with equal force, to the average Ohio farmer in reference to commercial fruit-growing. Hence, it looks as though a little more practical knowledge on the subject might not be out of place.

It is, perhaps, true, that to be a successful horticulturist, requires a little more science, or knowledge reducible to practice, as well as skill, in the performance of his work, than is essential in other agricultural pursuits. How to select fruits adapted to our soil and particular locality; how to plant; how to cultivate; how to prune; how to gather, and market our crops, are all important considerations. Not only this, but the continued cultivation of fruits has afforded facilities for the rapid increase of such insects as prey upon them, and destroy them, the codling moth, apple maggot, curculio, etc. Just what kind of insects, and how to defeat them, is what every fruit-grower should understand.

It is blind folly to think of success in commercial fruit-growing, by mere guess-work, and blundering in the dark. This will certainly result in useless waste of time and labor.

Science and art must be skillfully applied, with energy, industry and perseverance. We will not consume time in describing these insect-pests, or weary your patience in

discussing the best methods of repelling them, as we expect to hear of that, from those who have experimented on their orchards with insecticides, during the past summer.

Time will not allow us to enter into a general discussion of the many essential points to be observed in growing and marketing fruit, but only to notice a few indispensable requisites in commercial fruit-growing. An apple-orchard, for commercial purposes, should comprise but few varieties, and they should be such as are known to be hardy, productive, and adapted to the particular soil and locality of the grower. The fruit should be of good size, handsome appearance, and of good keeping qualities, and firm enough to ship well.

Apples when gathered, should be handled as carefully as eggs. Use clean barrels, and put in nothing but good, sound, merchantable fruit. Never put inferior fruit in the middle of the barrel. It will ruin your reputation. Such fraud is as bad as passing counterfeit money, and should meet with a like penalty.

No man can pack a large apple-crop without getting in, occasionally, an inferior apple; but this should be guarded against. The packer should see every apple that goes into the barrel, and no defective or wormy apples should go into the package. A single bad apple may injure the sale of a barrel of the fruit, as well as tarnish the reputation of the shipper.

Much harm has been done to certain localities, by the dishonesty of some individuals in filling the middle of the packages with inferior fruit.

The sale of American apples in Europe has been seriously injured in that way, and profits much reduced.

The only safe way to secure a good price, is for every commercial fruit-grower to make his packing uniform, and brand the barrel with his name and address, in bold-faced type. An honest measure of honest fruit, is a good advertisement. It will make you a reputation, and insure you a good market for your fruit, while dishonest packers will get left.

A reputation for honest packing is easily established, but perhaps more certainly ruined, by shipping inferior fruit.

By the way, please allow me to suggest that apples for shipping should be gathered earlier than is customary with most apple-growers. They will ship better, and keep better, than if allowed to hang on the tree until they get too ripe and mellow.

Not only this, but much of the crop is lost by being blown down by high winds in October. In 1886, apples were so plenty in Ohio, that farmers regarded them as of little value, and they were allowed to hang on the trees until over ripe; and on the 19th of October, thousands of barrels of good apples were blown down by a terrible wind storm, and literally went to waste, while if gathered early in October, and taken proper care of, the apples could have been sold before the first of January, for \$2.50 per barrel, by the car-load.

Apples when gathered and left in the orchard until barreled, should be piled on clean, wheat straw, and covered with corn-fodder, to protect them from sunshine, and carry off the rain; never cover with straw. The chaff gets down among the apples, sticks to them, and injures the appearance of the fruit.

Few of us appear to realize the growing importance of the fruit-industry in the United States. The distance that fruit is now transported by refrigerator cars, and the fast time made by express trains, has given wonderful impetus to commercial fruit-growing.

Fruits adapted only to certain localities, and formerly only grown for a home-market, are now distributed all over the country.

The California fruit-trade, for instance, has reached such an extent, that at certain times in the year, ten to fifteen car loads are daily disposed of in Chicago, much of the fruit being re-shipped to other places, all over the west.

While powerful locomotives fly with almost lightning speed across the continent, climbing the Allegheny mountains as if they were but mole-hills, and carrying hundreds

of tons of California fruits, to feed the hungry millions of the east, and at the same time Delaware and New Jersey peaches are being shipped to almost every city from Boston to the Mississippi river.

Strawberries grown in Florida, are sold in New York and Boston, as well as in Cincinnati and Chicago.

Apples grown in the United States are sold in Liverpool, London, Edinburgh and Paris; and bananas grown in Central America, are sold in almost every railroad town in the United States. Hence, we begin to realize the magnitude of commercial fruit-growing, and the importance of intelligent system in growing, harvesting, and marketing the products of our orchards and fruit-gardens.

In our northern fruit-growing regions, the apple is generally regarded as the "King of Fruits." Yet, since railroads afford facilities, for rapid and cheap transportation of our more perishable, yet more delicious and refreshing summer fruits, such as strawberries, raspberries, blackberries, grapes, and peaches, summer and fall apples are not so much in demand, at least at paying prices. Hence, apple-orchards for commercial purposes, should be mostly of the winter varieties.

PEACHES.

In favorable localities, and on soil adapted to their healthy growth, this delicious and highly-esteemed fruit, is a profitable crop to the commercial fruit-grower, but does not succeed in unfavorable localities. To make a success of peach-growing, we should select elevated sites, and warm, sandy soil; or, localities near large bodies of water.

The hills of south-eastern Ohio, are well adapted to peach-growing, and in certain localities on the shore of Lake Erie, and on the islands near Sandusky, no other crop will perhaps pay better, provided a judicious selection of varieties be made, and proper care, and culture be given. We regard Crawford's Early, and Late, as choice varieties, and perhaps adapted to the soil and climate of Maryland and New Jersey, and other favorable localities. Yet the past season has convinced me, more than ever before, that these choice varieties are not hardy enough to be profitable to the average Ohio peach-grower. Hence, the necessity of selecting hardy varieties, adapted to our soil and climate.

I am not prepared to name a list of varieties best adapted to our use; but will suggest, for early, Alexander and Troth's Early Red; for medium, Large Early York, George the Fourth, and Old Mixon Free; for late, Smock and Salway. Our experience is that a peach-orchard should be well cultivated; keep down all weeds and grass. In order to repel the worm, so destructive to peach-orchards, wash the trunk of the tree with strong suds, made from soap and carbolic acid, and scatter coal ashes around the root of the tree.

PEARS

Adapt themselves to most soils, and localities in Ohio. The greatest drawback to pear culture, is the blight. Our choice of varieties for commercial purposes, would be, Bartlett, Flemish Beauty, Clapp's Favorite, Lawrence, and Keiffer's Hybrid. Although the last named is 2d or 3d rate in quality, it will pay to grow for market.

QUINCES.

Quince-culture can be made profitable, if proper care and culture be bestowed upon it. The best soil is a rich, moist, clay loam, well underdrained. The ground should be well manured, and cultivated in some hoed crop, previous to planting, in order to get it in good condition. No fruit tree is more benefited, by manuring, and good culture, than the quince. Indeed, this careful treatment is absolutely essential to success.

The quince is a low tree, with a spreading top, and should be allowed to grow somewhat in its natural form.

Compared with other kinds of fruit, there are but few varieties of quinces recommended for general cultivation.

The "Orange" is best known, and most extensively grown, and we regard it as the most reliable variety. The greatest drawback to quince-culture is the borer at the root, and on the trunk of the tree. It can be kept in check by washing the body of the tree with a suds made from whale oil soap and carbolic acid.

PLUMS.

With intelligent care and culture, a plum-orchard may also be made a profitable investment. Like every other industry, in order to be a success, it requires energy, skill and perseverance. The operator must understand the habits and character of the curculio, and know how to defeat him; and while the average farmer and fruit grower neglects his plum-trees, and lets the "Little Turk" have his own way, unmolested, the intelligent commercial fruit-grower, who makes a specialty of his business, can make a success of plum-growing, and sell his fruit at paying prices.

A number of varieties may be profitably grown, but my experience and observation has convinced me that the Lombard is the most productive and profitable variety.

GRAPES.

Before the "rot" appeared in our vineyards, grape growing was one of the most profitable of horticultural pursuits, and perhaps this will still apply to certain localities where the grape succeeds. Fifteen or twenty years ago, the Concord grape was one of the most certain crops grown in Ohio; but of late, the crop has failed in many places, on account of the rot. Yet, in certain localities, this disease has not appeared. On the hilly lands of southeastern Ohio, and in western New York, along the Lake Shore, and at Euclid, Ohio, a few miles east of Cleveland, they have escaped this fatal disease; and on the islands near Sandusky, where considerable loss has been sustained, the disease seems, in a measure, to have passed away. Hence, in favorable localities, it may be safe to plant vineyards, for commercial purposes. Where the crop succeeds, there is more money in grapes, at two cents a pound, than in almost any other crop grown in Ohio.

Soil and location is an important consideration in commercial fruit-growing. The man who expects to engage in small fruit-growing, especially, had better pay two hundred dollars per acre for land adapted to his business, and favorably situated, than to pay fifty dollars for that unsuited to his purpose, although it might be well adapted to agricultural purposes.

The small fruit-grower should have easy access to either a good home-market, or a good shipping point, and also be near a town or city, where he can get help to gather his fruit. And in peach and grape-growing, especially, is the selection of suitable soil and location essential to success.

In Richland county, peaches succeed on elevated sites, and warm, sandy soil, while on level clay land, but a few miles distant, it would be a useless waste of time and labor to plant peach-trees.

I know of a peach-grower in Franklin county, Pennsylvania, who was offered \$50,000 for this year's peach crop, on less than one hundred acres of land, by a Boston fruit-dealer, while other peach-orchards, not five miles distant, failed to produce a crop.

Small fruit-culture has of late become an important branch of *commercial fruit-growing*; so much so, that the people in our large towns and cities are better supplied with these wholesome and refreshing luxuries, than the majority of the people in the rural districts, although horticulturists have, for years, urged upon the farming community, the duty of growing these luxuries for their own families. The average Ohio farmer does not appear to consider himself entitled to any of the luxuries of life, in common with other people, unless it be the privilege of chewing tobacco, and paying taxes.

To make small fruit-growing a success, the operator should be so situated as to have easy access to a good market, and should give careful and prompt attention to gathering and marketing the fruit. Neatness and good taste, in arranging any kind of fruit for the market, adds much to the profit of the crop, and especially does this apply to small fruits. Strawberries, raspberries and blackberries should be gathered in the most careful manner, and sent to market in the best possible condition. Fruit, carefully crated, not only sells more readily, and at a higher price, but gives much better satisfaction to purchasers and consumers. A very few unripe or defective berries will spoil the appearance of a whole crate, and depreciate its market value, especially in a large, city market, where choice fruit is appreciated. For market, size and productiveness are very essential qualities in a variety, and firmness sufficient to enable a fruit to "stand up" during transportation, is absolutely indispensable for a distant market.

By the way, we notice that some fruit-growers are constantly finding fault with railroad and express companies; but to us, they are a very great convenience, and it is due to these companies that we acknowledge, that in twenty years of shipping perishable fruits, we have never lost a single bushel, either by delay or careless handling, and the agents are always gentlemanly and obliging.

President: There are two important committees to be chosen at this meeting, and it is for the Society to say how they shall be appointed. The Committee on Examination of Fruits, and the Committee on Nominations for Officers of the Society, for the ensuing year: How shall they be appointed?

It was, by unanimous vote, decided that the Chair appoint the committees.

The President thereupon announced, for the Committee on Examination of the Fruits on Exhibition, Geo. W. Trowbridge, of Hamilton county; Leo Wetz, of Clinton county, and W. S. Ragan, of Greencastle, Indiana.

For the Committee on Nominations for Officers of the Society: Nicholas Ohmer, of Montgomery county; H. Cushman, of Cuyahoga county; G. S. Pickett, of Sandusky county; J. R. Hurst, of Ross county; James Edgerton, of Belmont county; W. S. Crawford, of Summit county; Leo Wetz, of Clinton county; W. C. Harris, of Wood county.

The President: As our present Secretary declines a re-election, it will be necessary for the committee to select a new Secretary to succeed him in the office. There seems, however, a difficulty in the way, as it will be necessary for the present Secretary to prepare and publish the report and proceedings of our Centennial meetings, as well as our present meeting, and the doings of the Society for the past year. There seems to be a necessity for retaining the services of the present Secretary, at least, until the preparation and completion of our next annual report for 1888-9. The constitution does not provide for such a contingency; only that the Secretary shall hold the office until his successor is elected.

L. B. Pierce said the most practical way would be to change time of election to the office, by an amendment of the constitution.

Secretary Campbell: The method proposed by Mr. Pierce would probably be best. The difficulty mentioned by the President occurred to me, but hoped it might be satisfactorily arranged in some way, as I intended, and desired, to retire from the secretaryship at this meeting. I recognize, however, the difficulty that any other person would have in preparing the annual report, and if it can be arranged in any way satisfactory to the Society, I will continue until the collation and preparation of the matter for the annual report is finished and published. Owing to the work being done by the State printer, the time when it can be issued is somewhat uncertain, as it is liable to be delayed by other work for the State. I retire from the secretaryship, simply because my own business takes so much of my time that I cannot give it that attention which I feel the Society has a right to expect, and I cannot fulfill the duties of the office to my own satisfaction, for that reason. I feel, also, that the best interests of the Society would be promoted by the election of a younger and more active man to the office. I feel grateful to every member of the Society for the uniform courtesy and kindness I have always received at their hands, and for the continued honor and confidence bestowed upon me during the many years I have been a member of the Society.

President Tryon: I think it will be well to elect our next Secretary at the next State Fair meeting, and would offer a resolution to change the time for election of Secretary to that time, during the State Fair.

W. W. Farnsworth: I think a better plan would be, to elect the secretary now, with a view of taking his position at the State Fair meeting, or, if it is desired, at some time previous to that meeting.

Geo. W. Trowbridge: The State Fair meeting is an indefinite time; and the regular annual meeting is the only proper time to elect officers.

President Tryon: I will suggest, then, that a committee be appointed to take this matter into consideration, and the Chair will entertain a motion to that effect.

A motion was then made, and carried, that the Chair appoint a committee to take into consideration the matter of the election of Secretary, and the time of his entering upon the duties of the office.

The President announced the names of L. B. Pierce, Geo. W. Trowbridge, and W. W. Farnsworth as that committee.

The Secretary presented the credentials of Mr. J. G. Kingsbury, of Indianapolis, Ind., as delegate to this meeting, which were duly accepted, and Mr. Kingsbury welcomed as an honored delegate.

OFFICE OF SECRETARY INDIANA HORTICULTURAL SOCIETY, }
BRIDGEPORT, INDIANA, December 7, 1888. }

To the Ohio State Horticultural Society:

This is to certify that J. G. Kingsbury, of the *Indiana Farmer*, is appointed a delegate, by the Indiana Horticultural Society, to attend your annual meeting, to be held at Troy, 12th, 13th, 14th inst.

C. M. HOBBS,
Sec'y Ind. Hort. Soc.

W. J. Green then offered the following resolution, which was, upon motion, unanimously adopted:

Resolved, By the members of the Ohio State Horticultural Society, in session at Troy, Miami county, Ohio, that Prof. W. H. Ragan, of Greencastle, Indiana, be made an honorary life-member of this Society.

W. H. Ragan: In response to this distinguished honor conferred upon me, I will take occasion to say, that I thank you for it, though I would like to have you leave off the title. I have long felt a desire to attend a meeting of your Society, for I have known a number of your members for years, and while I have attended several other State Society meetings, and on frequent occasions, it has so happened that my time was otherwise so occupied when your meetings have occurred, that I could not attend them before this time. It gives me great pleasure now to be with you, and I thank you again for this honor.

President: The next question is: Is there anything new to be said about the Russian varieties of apples?

Mr. Longenecker: Will it not be better now to drop the apple, and go on with the other fruits? or we may miss those that some of our fruit-growers are interested in.

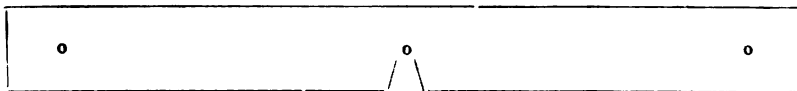
President: There is the question of the laying out and planting of orchards, that I think as profitable as that of the planting of small fruits: What is the best and most effective way of laying out an orchard? It is a somewhat difficult matter to get it just as you want it. The point is, to arrive at the best and most accurate way. In planting apple orchards, at one time, I found much trouble in placing each tree just where I desired. In laying out and planting the ground, the first important thing is to have the surface well prepared.

My plan for laying out and marking the ground for setting trees, is as follows:

The surface is first well pulverized with the plank rubber or crusher, or by diagonal harrowing. Set stakes to mark one side of the orchard where the first row of trees is to be planted, using care to have the line due north and south. Draw a chain along the line between the stakes, that being a convenient and accurate way of making a plain mark. Measure with a pole along the chain-mark, and drive a stake exactly where each tree in this row is to be set. The pole should be full length, so as to make one measurement for each tree. When one side is thus staked, two corners of the orchard are located. From corner No. 2, get a right angle. This may be done quickly and accurately with a

urveyor's compass, or by taking a piece of plank, one foot square, and marking across the center, each way, exactly at right angles; and putting four sights on these marks at the outer edges of the plank; then bore a hole in the bottom, and set the plank on a stake, at a suitable height. This gives the means of sighting in two directions, exactly at right angles. If one line of the sighting instrument is brought to bear exactly on the line already staked, the other sights will show accurately another side at right angles. Mark this side, measure and set stakes for each tree exactly as before. This gives two sides staked, and three corners fixed. Next, proceed with the sighting-instrument, and measuring-pole, to find the fourth corner. If the work has been accurate, this is quickly done; but I deem it prudent to fix the fourth corner, before staking the last two sides, by measuring accurately between the fourth and first corners, as a slight change of the line between the second and third corners may be necessary. Having thus squared the orchard, and fixed the fourth corner, measure and set stakes for the trees as on the first two sides. We then have stakes set for the outer rows of trees around the entire orchard, giving an accurate guide for laying off the entire field. Mark by the stakes both ways with the chain, or other marker, until the entire field is checked off. Dig the holes for trees where the marks cross, throwing the dirt into the triangle, not on the marks. In setting the trees, use a straight strip of board, long enough to reach the marks on either side of the hole, place the tree with the body against the strip on a line with the chain-mark in the other direction. If the work is done with proper care and accuracy, the trees will be in line in all points.

N. OHMER'S PLAN FOR PLANTING AN ORCHARD.



Board, 4 ft. long, 1-inch auger-holes at equal distances, in straight line, through center.

N. Ohmer: First, lay out your orchard as you please, in straight rows each way. Drive stakes where you want your trees; then place the board, figured above, in any way so as to bring the stake for the tree into the notch at the center of the board; then push a small peg into each hole at either end of the board, firmly into the ground; then remove the board, and dig the hole for your tree at the center stake. Then replace the board upon the pegs at the ends, and place the stem of tree in the notch, and plant, and so proceed throughout the whole orchard. The trees will then all be in regular rows. By this method, a blind man could do the planting.

President Tryon: There is no essential difference between Mr. Ohmer's plan and mine, except that he uses a board.

Mr. Branson: I would follow Mr. Ohmer's plan exactly, until I get my row of stakes set out, and then by sight, would set a center row across the orchard. It is practically finished when you have done that. After the stakes are set, you want no auger-holes; you can get your trees exactly right. You have no measuring to do about it. You have simply to set three rows of stakes, and so on, until your orchard is planted.

Mr. Ohmer said he had tried this plan. It would take very good eyes to set out a large orchard in this way, without measurements.

Leo Weltz, of Wilmington, said the plans mentioned were all good, but he thought his a still better one. After the ground was all prepared for planting, he simply takes a plow and runs straight furrows one way across the orchard whatever width apart he wishes the trees planted. He then runs the furrows across the other way, at right angles, the same width apart, and then plants his trees at the intersections of the rows. There is little trouble in planting in straight and even rows, on level ground, by almost any method. On uneven or hilly ground it is more difficult. He advised not to plant crooked, or ill-shaped trees.

L. B. Pierce said the Nominating Committee would soon be in session, and that the report of the Committee on Amendment of the Constitution was now ready to report. This should be acted upon before the nominations were made. He then made the following report, as chairman of the committee :

Resolved, That article 3d of the Constitution be amended to read as follows :

3d. Its officers shall be a President, Vice-President, Secretary and Treasurer, who shall, in addition to their official duties, constitute a Board, empowered to fill all official vacancies that may occur during the year, by death or resignation. They shall be elected, annually, by ballot, and hold their offices until their successors are elected ; but the Secretary shall not enter upon the duties of his office until the first day of August, following his election.

L. B. PIERCE,	} Committee.
GEO. W. TROWBRIDGE,	
W. W. FARNSWORTH,	

President Tryon: The new Secretary, it is understood, will not draw the salary until he begins his work ; it is expected that the retiring Secretary will have completed his report by the first of August, and that the new Secretary will assume the duties of office, and commence his work for the year at that time.

It was then moved and seconded, that the proposed amendment to the Constitution be accepted and adopted, and the motion was carried by unanimous vote.

President Tryon: We will now take up the discussion of Pears. The subject of spraying with liquid poisons will be deferred for the present—as we expect a paper from Professor Weed, who has not yet arrived.

What new facts in Pear culture have been developed during the past season ? Which of the newer varieties have been found the most useful ?

N. H. Albaugh spoke favorably of the Keiffer pear so far as growing it in the nursery is concerned. It is a variety he has no trouble with ; and seems to be blight-proof.

The Secretary asks if the Keiffer pear has been found to be blight-proof generally, throughout the State. At Delaware, he had found it not

only subject to blight, but unable to stand uninjured, in very severe winters.

Geo. W. Trowbridge had not found it free from fire-blight; but it was, comparatively, less affected with leaf-blight than some others.

Leo Weltz said also that the Keiffer was not free from blight.

N. Ohmer said he had some Keiffer pears presented him that were well-grown but not ripe; and he laid them away in a drawer; he found that they ripened up handsomely, and he found them so much better than he expected, he thought he should plant some trees.

J. S. Pierce said if we were going to plant Keiffers for our children, we must never let them eat Seckels.

J. S. Kingsbury, editor of the *Indiana Farmer*, read an article from correspondent for his paper, claiming that spraying the trees with Paris green appeared to be a remedy for blighting of the leaves, and also for scab, as the pears were unusually perfect.

L. B. Pierce said he did not see how the use of Paris green could save the leaves. At the meeting of the American Pomological Society, at Ann Arbor, sulphite of soda was recommended as a remedy for leaf-blight and apple-scab.

Mr. Kingsbury said the correspondent whose report he had read, was a very reliable man; and as not only the leaves were freed from blight, but the pears were perfect, we might be willing to believe that spraying might have destroyed the fungus growth that caused the trouble.

B. F. Albaugh said the foliage of pear trees was often badly injured by the slug; which might have been the cause of blighted appearance. Paris green would destroy the slug upon the leaves, and in this case, spraying would be an effectual remedy.

President Tryon: We have used Paris green sprayed upon our apple trees; but, am sorry to say, we found it no remedy for either scab or leaf-blight. Our apples were so scabby, and leaves so badly blighted, we were almost inclined to think it was caused by the spraying.

Has the Idaho pear fruited in Ohio? or have any of our members knowledge of it?

T. F. Longenecker said he had seen one pear, which was of good size and appearance; and as he had eaten a part of it, found it of good, but not remarkable, quality.

W. W. Farnsworth exhibited a large and handsome specimen of the Duchess d'Hiver, or Winter Duchess, which was still firm, and hard, and evidently not yet in eating condition. It closely resembled the Duchess d'Angouleme in size and general appearance; but no one seemed able to speak as to its general character or promise for usefulness. It was referred to the Secretary for examination, and further report.

W. J. Green said, in reference to the Idaho pear, he had tried to get the Idaho pear, but had not succeeded. He asked for information from those who had grown the Le Conte pear. Has it been found hardy?

L. B. Pierce said the LeConte had borne in Summitt county this fall.

W. W. Farnsworth: My experience indicates, that it is about as hardy as a peach-tree.

Geo. W. Trowbridge has found the LeConte a handsome and perfect tree in growth, and fruit rather better than the Keiffer.

E. H. Cushman has grown the LeConte four years, and it is as handsome a tree as any-one could desire to look at; and in his locality, it seems hardy. It has sometimes grown as much as four feet in one year. He would grow it for ornament, if nothing else.

E. M. Buechly, of Darke county, has grown the LeConte five years. It was the thriftiest grower he had, but not hardy, as it was frozen and killed, nearly to the ground, during severe winter.

Leo Weltz exhibited two varieties of Japanese pears, the Mikado and Sieboldii, which he said would do well in Ohio, and are both healthy and beautiful as ornamental trees. He had seen no trees of finer growth. They can be grown from eyes or buds.

Mr. Buechly does not think they are quite hardy.

W. J. Green said he had grown and fruited the Mikado. It was a fine appearing pear, but had a flavor like the quince, and the texture of a turnip.

A motion was made to adjourn to 2 o'clock P. M., which was carried.

THURSDAY AFTERNOON, *December 13, 1889.*

President H. G. Tryon called the meeting to order, promptly at 2 o'clock. The Business Committee reported no change in programme. The Treasurer's Report was next in order. The Treasurer not being present, the report was read by the Secretary, as follows:

TREASURER'S REPORT.

Ohio State Horticultural Society in account with J. J. Harrison, Treasurer.

Amount on hand, January 1, 1888.....		\$903 34
Received for membership to December 10, 1888.....		50 00
1887.		
December 31. Paid J. G. Bilderback for premium overlooked in '86..	\$2 00	
1888.		
January 5. Paid Emery & Smith, stenographers.....	43 55	
11. " stamps per Sec'y Campbell, Reports to members.	1 00	
February 13. " express on Illinois Reports.....	35	
March " " Michigan "	60	
May 8. " " Minnesota "	1 15	

June	13.	Paid to Columbus, account printing reports.....	\$1 55	
	13.	" for engravings for reports.....	3 50	
July	2.	" express on Indiana Reports.....	40	
	5.	" stationery and stamps.....	1 00	
	14.	" expenses to Indiana summer meeting.....	9 40	
	18.	" General Hurst, for cold storage building at Centennial.....	150 00	
August	24.	" stamps for circulars for meetings	15 00	
September	6.	" expenses meeting at Columbus	2 00	
	17.	" express charges on annual reports from Columbus.	1 10	
	17.	" postage on same, mailed to members.....	10 75	
	17.	" express on Iowa Reports.....	85	
	20.	" expenses meeting 19th and 20th, at Columbus.....	3 60	
	20.	" stenographer's admission to fair-grounds	1 00	
October	2.	" express on bound copies of Reports.....	40	
	10.	" bills and circulars for meetings August 25 and September 15 and 27	9 35	
	17.	" Myers Bros. bill printing and binding Reports...	52 50	
November	6.	" postage for Reports, etc.....	2 50	
	24.	" " circulars for annual meeting.....	9 00	
	27.	" express on package Reports to Vice-President.....	25	
	27.	" reporter's fee at Centennial.....	10 00	
	30.	" postage stamps for reports, etc	2 00	
December	7.	" circulars for annual meeting.....	8 00	
	7.	" envelopes for same.....	1 25	
	7.	" Secretary's salary one year	300 00	
	11.	" F. R. Palmer's bill.....	9 35	
			<hr/>	
			\$653 40	\$653 34
				653 40
				<hr/>
Balance on hand				\$299 94

President: The next thing in order is the report of the Committee on Nominations:

Mr. Ohmer: We worked hard, and we worked late. We were late to dinner, and we were late getting back, but we have completed the nominations. The Committee reports the following nominations for officers of the Ohio State Horticultural Society, for the ensuing year:

President—HOSMER G. TRYON, of Lake county.

Vice-President—GEORGE W. CAMPBELL, of Delaware county.

Secretary—W. W. FARNSWORTH, of Lucas county.

**Treasurer*—GEORGE W. TROWBRIDGE, of Hamilton county.

AD INTERIM COMMITTEE.

GEO. M. HIGH, of Ottawa county.

MATTHEW CRAWFORD, of Summit county.

F. R. PALMER, of Richland county.

THEO. F. LONGENECKER, of Montgomery county.

*Mr. G. W. Trowbridge declined acceptance of the office, after election. His resignation was accepted, and N. H. ALBAUGH, of Montgomery county, was elected Treasurer in his stead.—[SECRETARY

JAS. EDGERTON, of Belmont county.
O. W. ALDRICH, of Franklin county.
HENRY YOUNG, of Hardin county.
NELSON COX, of Lawrence county.
S. H. HURST, of Ross county.
S. R. MOORE, of Muskingum county.

President: Gentlemen, you have heard the report of the Committee. Any remarks?

Secretary: If it is possible to have the nomination for Vice-President changed, I would much rather the Vice-Presidency should remain as it was. I am sorry to say that I am, in a measure, incapacitated from holding the office, as, with advancing age, my hearing has become imperfect.

Mr. Ohmer: Allow me to say a few words with regard to the remarks made by the Secretary, Mr. Campbell, in declining the Vice-Presidency. He said he was a little hard of hearing. I have been acquainted with him for a good many years, and have never discovered any difficulty of that kind. I think the nomination should remain as it is. I think we can make him hear well enough.

The motion was then made, seconded and carried, that Mr. N. Ohmer be authorized to cast the ballot of the Society for the election of the officers as reported by the Nominating Committee.

The vote was then cast, and the ticket was then declared duly elected.

President Tryon: I tender my sincere thanks to the Society. I appreciate the honor conferred upon me, and will do all in my power to serve you to the best of my ability.

Secretary: I appreciate the honor you bestow upon me, and sincerely thank you, although I do not say much.

President: We will pass to the next topic: "Which of the new varieties of grapes can be recommended for trial or for general planting?"

Secretary Campbell: My ad interim report was not made at the time the others were read, and as it has some remarks upon the new grapes of recent introduction, it may serve as an opening of the subject named by the President for discussion. The first part of the paper contains my report for the past season; the latter part may have more interest, as it was written by some one else.

AD INTERIM REPORT FOR CENTRAL OHIO.

BY GEO. W. CAMPBELL, OF DELAWARE COUNTY.

The past season has been one of full average fruitfulness. Last winter was mild in its average temperature, the thermometer not marking more than 15 degrees below zero at any time. As a natural result, peach-buds, and our half-hardy grapes, were uninjured during the winter, and except where they were hurt in some exposed places, by late Spring frosts, gave good crops. The apple-crop in our section was large in proportion to

the number of fruiting trees; but I am very sorry to say, the fruit is unusually imperfect. This is very largely due to the attacks of insect enemies; the most damaging of which seem to be the codling moth and the curculio. In nearly all the apples I have seen brought to our market, it is very difficult to find a really fine, smooth and perfect specimen. The necessity for united and vigorous efforts in the way of spraying our orchards with the now well-known and approved arsenical poisons, is very apparent in our section of Central Ohio. I know of but one man in our county who has practiced it in any thing like a large way—Horace McMaster, who has extensive orchards—and he reports the most gratifying success, and a determination to pursue it hereafter more vigorously than ever, being convinced that it pays him largely by improving the character and appearance of his fruit. I think he experimented with both Paris Green and London Purple, making in the first instance the common mistake of using too strong a solution, and somewhat injuring the foliage of his apple-trees. One pound to 50 gallons of water he finds rather too much, and recommends one pound to 100 gallons of water as strong enough. He used the Dayton machine, with Climax nozzle.

Peaches were abundant and good, wherever there were vigorous and healthy trees. But, in consequence of a series of severe winters for several years—excepting the two seasons just past—which have in many places not only seriously injured the trees, but killed many outright, peach-trees are very scarce. We are hoping that a season or series of milder winters may hereafter prevail; and there is again a disposition, notwithstanding former discouragements, to plant peach-trees largely in many parts of the State.

Pears were quite plenty, and all trees that were in good condition seemed to bear well; and the fruit in our section, was proportionally fairer and less injured by insect pests than apples. Blight has also, for the past two years, been less prevalent than heretofore, seeming to indicate that the idea which I have entertained may be correct; that blight is more likely to occur, following very severe winters, than after mild ones.

Neither plums nor cherries are largely grown in our neighborhood, the sweet or heart-cherries being generally unreliable. The sour-cherries have, however, been quite abundant in our market, the past season. The same may be said of plums; and both have been fairer and less injured by the curculio and his congeners, than heretofore.

Cultivated blackberries are grown but little, but the few brought to our market were sold at good prices. The wild varieties from the woods and field were the main supply.

Raspberries were quite plenty. For black-caps, the Souhegan and Gregg take the lead for early and late. Some Doolittles are also grown with profit. A new black-cap, which has since been named the Palmer, was sent me the 3d of July, last, which impressed me very favorably for its fine appearance, remarkable vigor of growth and productiveness, as well as its good quality. Several bearing canes were sent me entire with the fruit, and they were remarkable specimens. This berry originated by Mr. F. R. Palmer, of Mansfield, and has received favorable notices from many competent judges as to its probable value for a good, very productive, and very early black raspberry. The Cuthbert has proven one of the best, if not the best, of the red raspberries for our locality, and some of our market growers are very enthusiastic in its praise. Turner is probably the best of the older kinds. Marlboro' is also doing well, and at present seems about as promising as any of the late introductions. Shaeffer's Colossal seems growing in favor, and as it becomes better known, its good qualities are recognized, and its dull color is found less objectionable. It found a ready sale in our markets the past season. The Golden Queen, which has the general habit of the Cuthbert, and is said to be a sport, but is probably a seedling of that variety, seems to be now the most promising yellow raspberry. Its flavor is good, and its size and form much like the Cuthbert. I have only tested it one season, and cannot say anything very decided in regard to it from personal experience, though I have seen it growing and bearing fairly well in other places.

I intended, while noticing blackberries, to say a word about the Lucretia Dewberry. Several of our growers have planted it to a limited extent, and are quite enthusiastic in its praise. I notice also that Mr. Caywood, of New York, speaks very highly of it,

and he recommends raising it from the ground, pruning and training it upon stakes or trellis, and finds it to succeed admirably under this treatment, bearing heavily, and the fruit remarkable for large size and excellent quality.

Strawberries have been fairly abundant wherever the vines measurably resisted the drought of the previous season; but the Wilson and Crescent were the principal varieties brought to our markets, the host of new varieties not yet being able to supplant them with most market growers. A few Charles Downing and Cumberland are grown, and command much better prices; and some Sharpless, imported, sold at nearly double the price of Crescent, bringing 18 and 20 cents per quart. I have been hoping to see the Jessie, Bubach, Crawford, and berries of that character, take the place of the Wilson and Crescent. And I still hope to see the day when the public taste will demand something better.

It will be expected, perhaps, that I should say something about grapes; but I have not much to tell you, beyond what you have already heard. I have seen, and partially tested, some of the new varieties that have been lately offered, and will give my present impressions of their character and probable value.

The Jewel, a black grape, originated by John Burr, of Leavenworth, Kansas, seems to have a hardy and healthy vine, of moderate growth, the wood and foliage resembling the Early Victor. The clusters average about the size of the Delaware, berries somewhat larger. Its principal recommendations are earliness and fine quality. It colors early in August, and at Delaware, has been ripe enough for market about the middle of August, though it will hang upon the vine a month longer, without losing character or flavor, or falling from the stem. The flavor is pleasant, sweet, slightly vinous, a little pulpy until quite ripe; not foxy; and by many persons thought to be as good as the Delaware. I should hardly place it so high in the scale of excellence; but I have seen no other black that is as early that is anywhere nearly as good. It has been remarkably free from either rot or mildew; and its only faults seem to be, rather small size and moderate growth of vine for a popular grape for all purposes.

Another new, black grape, by Mr. Caywood, called Nectar, is offered for sale. I have seen it on exhibition several times, under the name of Black Delaware, as it is claimed to be a cross between Concord and Delaware. It is a handsome grape, with regular, medium large clusters; said to be very fine in quality, but I have not seen it when quite ripe. It seems to be a little later than Concord. The vines, as I have grown them the past season, are vigorous and healthy.

The Eaton, which comes from Massachusetts, with the sanction of the Massachusetts Horticultural Society, is also offered for sale. I believe it is claimed to be a Concord seedling, and the vine seems to be somewhat of the Concord type, with stronger growth, larger leaves, and bearing larger clusters, and berries. It is a very handsome and showy grape; but apparently later than the Concord; and to my taste, not as good. It is not more foxy, but much more acid. In appearance and quality, a good deal like the old Union Village grape.

The Mills grape, which originated in Canada, is also offered by eastern nurserymen, with high commendation. From my experience the past season, I fear it will not prove valuable for general planting, as the vine suffered so badly from mildew of the foliage, that it did not mature its wood.

The Downing grape suffered in the same way, nearly as badly as the Mills; and I think neither will prove valuable, except as amateur, or garden grapes, and in very favorable localities.

In red grapes, the Moyer comes from Canada, named after its originator, with the claim that it is equal to the Delaware in quality, and earlier in ripening; with a vine able also healthier and of better growth. I have grown the Moyer the past season; the foliage seems thicker and more capable of resisting mildew than the Delaware; but the growth is not much, if any stronger. From what I have seen, I think the clusters will not average as large as Delawares, and this will probably interfere with its popularity. If, however, it proves to be, as claimed, the earliest, and best in quality of all

red grapes, its small size may be overlooked, until a larger grape as early and as good is introduced.

Among the new, red grapes, the Woodruff Red is worthy of mention. With an iron-clad vine of the strongest growth and healthiest foliage, bearing clusters and berries both of the largest size; ripening a little before Concord, but keeping in good condition equal to any other native grape known; of a beautiful and attractive red color, and in quality good enough to suit the great majority, and to sell in market at wholesale at 8 cents per pound when Concord brought but 3, I cannot help regarding it as the best and most valuable red grape for everybody to plant, for general use, not only for family use, but for profit in market.

In white grapes, the Empire State, the Niagara and the Pocklington, are the most prominent of the new varieties. All have their good points, and are largely planted. All have succeeded well in many localities, but have failed more or less in others. I think the Pocklington has succeeded rather the best in unfavorable localities, by reason of its greater hardiness in severe winters. It is, however, later in ripening than either of the others.

The Witt grape, which has been exhibited before our Society several times, has many good qualities to recommend it. I think the vine is as hardy and as healthy as the Concord, or any of its seedlings. The fruit is handsome, with good-sized bunches and berries. Skin thin, seeds small, quality very good. The Witt ripens about with the Concord, and seems to me one of the best of the white Concord seedlings. The vine is productive, but not quite as strong in growth as the Concord. It originated with Michael Witt, of Columbus, and is worthy of trial by all who are looking for something new and really good.

The Colerain grape, exhibited at our Centennial meeting by Mr. Wm. Bundy, of Belmont county, is another handsome grape, which seems very promising, and is also a white Concord seedling, somewhat resembling the Witt grape in its general appearance, and is fully equal to it in quality. It ripens a few days earlier, and the vine seems to be a little stronger in growth. Both these grapes are of Ohio origin, and, I believe, will be found valuable. The Colerain is not yet offered for sale, so far as I know.

I will say a few words of my own experiments in the way of originating new varieties of grapes, which may have some interest, although these experiments have been conducted for thirty years, without attaining the results for which I have been striving. I have been honestly, and conscientiously, trying to produce varieties of grapes suited to general cultivation, better in quality, and at the same time with vines hardy and productive, and foliage healthy in all grape-growing localities. In short, better varieties, in some important respects, than any we have already. I have now, no doubt, that I have discarded and thrown away hundreds of varieties because they did not come up to my ideal standard, that might have proven valuable in many places. I believe, if I had produced the Niagara grape, I should not have ventured to introduce it, simply because it is not hardy enough in severe winters, and the quality is not as good as I should desire. I have produced a great many hybrid varieties, which are better than many that have been introduced with extravagant recommendations, but have proven only suited to a few and specially favorable localities.

One thing which I have been long trying to produce, is an improvement upon the Delaware. A vine with healthier foliage, stronger growth, and with increased size of the fruit, retaining its fine quality. Twice I thought I had attained substantial improvements—but in both cases, after a full trial, they were discarded, and the vines destroyed, because the berries would fall from the clusters as soon as a little over-ripe. I am glad to say I have now another under trial, which is free from this defect, with a vine fully as strong as Concord, and with healthy, mildew-resisting foliage. The fruit resembles Delaware, and it would take an expert to tell one from the other. It has fruited for three years, and I now think I shall, perhaps, have the courage to offer it for sale, when a sufficient number of vines can be grown for that purpose.

I have several Niagara seedlings—one of which may be valuable on account of earliness—being three weeks earlier than the Niagara in ripening—handsome in appearance, being of a light, lemon-yellow, and quite free from foxy taste or odor. The vine, in habit of growth and vigor, is fully equal to its parent. The principal value will probably be for *earliness*; and for all localities where the Niagara is profitable.

I have, also, a very interesting lot of crosses of our best natives upon the Southern *Rupestris* type. A few of them have fruited, and promise to be really a new class or type of grapes—different from anything now known. Although the *Rupestris* is of southern origin, I have found nothing so entirely healthy in foliage nor so perfectly hardy in winter; and I now hope the crosses with our natives may retain these valuable characteristics. Some that have fruited are very satisfactory—others not. I have great hopes that grapes of value, both for wine and for table use, will result from these crosses. I will now only say that I have growing of this class, crosses with some of the best hybrid varieties, and with Delaware, Brighton, Pocklington, Vergennes, etc., and one with a foreign variety, the Muscat Hamburg—and although both these are black, they produced a small, red grape, closely resembling the Delaware. The foliage of this variety, however, shows too much of the foreign element, and mildews in unfavorable seasons. It will probably have no value, except as a curiosity. I have many others, but have said enough, for this time. I cannot, however, let the occasion pass without saying something of the new remedies, which, I am happy to say, really seem to promise success to all who will intelligently use them as preventives, both of mildew and rot, in the grape. I have, myself only experimented in a small way; but so far as my experiments have gone, they confirm the opinion that successful and practical remedies have been found for these maladies so dreaded by the grape-grower. By permission of our friend and fellow-member, George M. High, I will read you a letter from him on this subject, giving an account of his experiments, which I regard as the most valuable contribution which I have seen; and the most conclusive of any experiments recorded in this country. Mr. High deserves great credit, and the thanks of the whole grape-growing community, for the care with which his experiments have been made, and for the intelligent manner in which he has recorded the results.

The Secretary read the remarks which were made by Mr. High, at the meeting on the Centennial grounds, on the afternoon of September 20, and which will be found in the report of the proceedings of the meeting at that date.

The following letter upon the same subject was also read, and which was written on the 24th of November, 1888, after he had gathered his grapes, both from the treated, and untreated portions of his vineyard.

Mr. High wrote as follows:

"I will say further, in reference to the gathering of the crop—while pickers in the sprayed block would pick seventy-five to eighty-ten-pound baskets each—in the unsprayed portion, twenty-five to thirty was all that could be done. The yield from the sprayed vines was 30 to 40 per cent. greater; and what is another great advantage, the foliage hanging late, ripened the wood much better, and it will be better able to withstand the cold. I shall, if living, give my entire vineyard the remedy next year. The difference in the cost of gathering alone, will more than pay for the *eau-celeste* used. On the five acres, the cost was only about \$6, outside of the labor and spraying-machine, which is merely a nominal matter, in comparison with the benefits derived."

J. G. Kingsbury, of Indiana, brought forward a few clusters of a small, dark-red grape, said to be a seedling originated in Hancock county, in that State. It had been named "Mary's Favorite." The grape was very pleasant-flavored, and showed remarkable keeping qualities, being then, the middle of December, in good condition. Mr. Kingsbury said the

grape was reported upon very favorably by grape-growers who had seen and tested it, and he would like to have the Secretary give his opinion of it.

Secretary: As Mr. Kingsbury asks my opinion of this grape, I will say, it is much like the Delaware. The originator sent me a vine for trial, and I find it a very strong grower, with large, thick, heavy foliage, not inclined to mildew. The quality of the grape, as shown by the specimens exhibited here, is excellent, and its keeping qualities remarkable. Its rather small size seems the only thing against it. In every other way, I should regard it as a very promising grape. It is supposed to be a seedling of the Delaware. The clusters are about the size of Delaware, with berries a little larger, and similar, but much darker in color.

President: We have only a short time, and there is a very important topic yet. The subject of new grapes has been very fully opened by our Secretary. Is there anything further to be said on that topic? If not, we will pass to the second. What can be said of the new French remedies for mildew and rot?

Secretary: It seems to me, that Mr. High has explained it so well it hardly needs further discussion. I will repeat again what I said of the preparation for spraying. The sulphate of copper is what is commonly known as blue vitriol. One pound of sulphate of copper, dissolved in two or three gallons of heated water. When cool, add one and a half pints of liquid ammonia; then add twenty gallons of water. This liquid is sprayed upon the vines in any way most convenient.

An inquiry was made about the Jessica grape, to which Mr. E. H. Cushman replied: I have fruited the Jessica several years. It is a good grower, but the bunches are small. It is a very sweet grape, and the vine is healthy. I should say that if I wanted to grow grapes where they did not succeed generally, I should plant that grape, expecting it to succeed.

Henry Young: I have fruited the Jessica for two years. It does well with me. It is sweet, and of good quality, but small.

Mr. Cushman: I would like to ask where the gentleman grows this grape?

Mr. Young: Ada, Hardin county.

President: Anything further on the Jessica? It will be remembered that this grape was recommended by Mr. Crawford, a year ago. The next topic is: What has been the experience of members with bagging grapes. If any one has had any experience of value, we should be very glad to hear it now.

Reports from several members were, that so far as tested, in a small way, bagging grapes had appeared to be successful in protecting the fruit from the attacks of birds and insects; and that when the bags were put on before the appearance of rot, it was a preventive of that malady.

F. R. Palmer has bagged grapes to a small extent, with fairly good success, but doubted if we could do it in a large way for market.

Mr. Snider: As to bagging grapes, in our section of the country it is done after night, and is more satisfactory to the baggers than the owners of vineyards. I have been in the business for 30 years, and at first had to grope my way in the dark; but every grape I have planted has been a success. I have never missed a crop but once in thirty years, and then it was on account of a hail-storm. Insects and rot never trouble me. I think the whole difficulty in raising grapes, in this country, is to find the natural home of the grape, and when you have found it, you will not be troubled with rot, at all. It is only by experiments that I have learned what I know. I am 10 miles south of latitude 40, and 30 miles south of Columbus, and my soil is sandy loam. I cultivate, hoe, and keep my vineyard clean, and fertilize with composted stable-manure. My vines are planted 6 by 8 feet, and are principally upon a side-hill, where I can plow only one way, and just deep enough to keep down grass and weeds. When my vineyard was young, I grew strawberries between the rows.

President: This is a very interesting topic, and I wish we had more time to speak on the grape; but we shall have to leave it, as we have but very little time, and a good deal yet to do. A paper from Mr. L. B. Pierce is next in order.

L. B. Pierce: About the 19th of September I prepared a paper upon Forestry, which has been mislaid, and I could not find it anywhere, so I have only a few notes to read, which will open the subject for discussion.

President: Perhaps it would be better to hear the other paper first; and after this, if there is time, we will hear his notes, and have a discussion on Forestry. If there is no objection, we will hear the paper of Prof. Weed, of the Ohio Experiment Station.

Mr. Clarence M. Weed read the following paper:

SOME ELEMENTS OF SUCCESS IN FIGHTING INSECTS.

BY CLARENCE M. WEED.

One of the first essentials of success in fighting any of our insect enemies, is a knowledge of the insect itself—of its habits, its transformations, its food plants, and of the insect and other enemies with which it has to contend. For, until these points are clearly made out, we cannot tell when, where or how the enemy may be most successfully fought, and what aid to expect from our natural allies in subduing it. "The life-histories of insects," says Prof. S. A. Forbes, "lie at the foundations of economic entomology; these must be correct and accurate, or all is indefinite and uncertain."

I can best illustrate this fact, by briefly calling your attention to a few of the general laws by which the insect world is governed, to the application of which, in the elucidation of the life-histories of individual species, we are indebted for many of the most important advances in economic entomology.

Most of our common insects pass through four different stages of existence, viz.: (1), the egg; (2), the larva, or caterpillar; (3), the pupa, or chrysalis; and, (4), the adult, or imago. These various forms may be conveniently illustrated by the common apple-worm, or codling-moth. The small chocolate moth (*f*, *g*, fig. 1) deposits its eggs in spring in the blossom-end of the young apple, before it has turned down on its stem. From this egg, there hatches a small worm, or caterpillar, which nibbles at the skin of the fruit and eats its way toward the core. Here it continues feeding as the apple develops, increasing in size, until, at the end of three or four weeks, it is about three-fourths of an inch long, and appears as represented at *c*. It has now finished its caterpillar growth, and leaving the apple, finds some crevice in the bark, where it spins a rather slight silken cocoon (*i*) in which it changes to a pupa (*d*). It remains in this condition

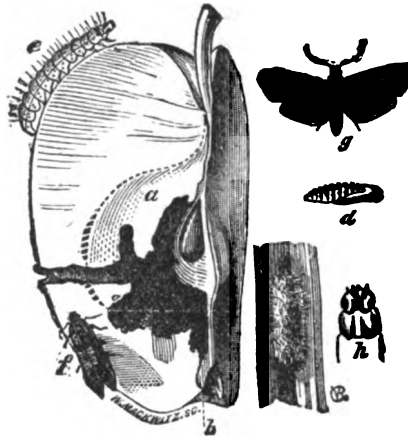


FIG. 1.

about a fortnight, when it emerges as a moth, like the one by which the original egg was laid. Thus the life-cycle is complete, and in the same general way, but with infinite variations, untold millions of insects are living day after day, and year after year—each presenting in one form or another, that great mystery of life, which the world, for a thousand years, has been attempting to unfold.

We must also know that there is a marked difference in the way in which insects take their food. Some insects bite, while others suck; so one class may be destroyed by internal poisons, while the other must be fought by some substance acting on the insect externally. For instance, the potato-beetle is easily poisoned by applying Paris green to the foliage it devours; but this substance has no effect upon the chinch-bug or plant-lice, which obtain their food by inserting a sharp-pointed beak into the leaf-substance and sucking out the sap.

But, besides knowing about the life-history and habits of the insect itself, we must know something of its enemies, and this leads us to a study of the peculiar inter-actions among insects, by which what has been called the "balance of Nature," is regulated. Were there no checks upon the increase of almost any plant-eating species, it would multiply until it had reached the limits of its food supply; but, in accordance with the old, and oft misquoted, couplet,

The little fleas that do us tease,
Have other fleas that bite 'em,
And these in turn have other fleas,
And so, *ad infinitum*.

Many families of insects live solely to destroy other insects. This is done chiefly in two ways; one by attacking the insect from the outside and devouring it bodily, and the

other by developing within the insect, and thus destroying it. Those of the first kind are called predaceous insects, and the second are the true parasites. Predaceous insects may be likened in their habits to the lions and tigers among the larger animals, as they go about seeking what they may devour. For a good example, mention may be made of the common ground-beetles, some of which are known as caterpillar-hunters. These large and handsome insects feed upon army-worms, canker-worms, cut-worms, and various other small species, of which they destroy great numbers. Other kinds of predaceous insects are the trim little lady-beetles, which feed upon plant-lice, and the two winged robber-flies, and the four-winged dragon-flies, which prey upon other insects flying in the air. Still other predaceous insects live in the water, and devour young mosquitos and similar pests, while yet others burrow through the soil and devour the creatures found there.

The insects of the second class, are equally beneficial in destroying the hosts of destructive plant-eaters. As an illustration of these we may take the small, four-winged fly, which preys upon the common tomato worm, and also upon the grape-caterpillar. This fly deposits, by means of a long needle-like instrument called the ovipositor, great numbers of its minute eggs beneath the skin of the worm. In a short time, these eggs hatch into grubs, which subsist upon the juices of the worm, and grow entirely at his expense, compelling him, so to speak, to run a free lunch-counter for their benefit. In a



Fig. 2.—CATERPILLAR AND PARASITES.

few weeks, the caterpillar is half-dead from the effects of their injuries, and the grubs bore holes through its skin, and spin silken cocoons, upon its back (fig. 2). Within these cocoons the grubs change to four-winged flies (shown natural size, and enlarged at right of fig. 2), like those by which the original eggs were laid, which gnaw off the tops of the cocoons, and sally forth to search for new victims, in which

to place their eggs. The unfortunate caterpillar lingers on in a half-dead condition for a while and then dies. But even these parasites do not have things entirely to their liking, for they are themselves subject to the attacks of a still smaller parasite, which frequently destroys great numbers of them, as they destroy their host.

It is by just such intricate arrangements as these, that the even balance of life is preserved, and one species is prevented from sweeping all others from the face of the earth. In the history of almost any common insect, there may be traced a regular increase and decrease in numbers, due largely to its predaceous and parasitic enemies. As the "hosts" increase, the parasites also increase, until a certain point is reached, when the hosts become so scarce that the food supply of the parasites is limited, so that they must decrease. Then, the hosts again enjoy a period of unmolested development. In this way, each species rises and falls at regular intervals, and Nature's balance adjusts itself.

Besides a knowledge of the insect itself, and its friends and foes, to successfully prevent its injuries, we must know something of the substances used in repelling or destroying insects. These substances are commonly called *insecticides*, and they may broadly be divided into two classes: (1) internal poisons, or those which kill the insect by passing into the alimentary canal; and (2) external irritants, or those which are applied externally, closing the breathing pores, or causing death by irritation of the skin. Besides these, other substances are used in preventing insect attacks—keeping them away by offensive odors or acting simply as mechanical barriers.

Another important element of success, is the use of effective apparatus in applying insecticides. Fortunately, there are now on the market, a large number of devices for the application of these substances to vegetables, shrubs and trees; and one can obtain a satisfactory machine at a reasonable price.

The fact that our chances of subduing any insect outbreak are best when preventive or remedial measures are *promptly* taken, is too apparent to need elaboration. By timely and decided action, the evils arising from insects can generally be nipped in the bud, and every day that passes before this is taken, not only sees more injury done, but finds the insect more vigorous, and harder to subdue.

The benefits to be derived from *co-operation* are no less marked in subduing insect enemies than in the many other ways in which men help each other by banding together for a common purpose.

And, finally, the successful agriculturist must always remember that the law of the fittest holds good no less in the cultivated field than in the primeval forest, that the more vigorous a plant is, the better is it able to resist the attacks of enemies of every kind, and that, as has been truly said by one of America's leading entomologists, "Good agriculture is the first and best insecticide."

Mr. Cushman: Is there any successful remedy for the cabbage worm?

Mr. Weed: Well, some people tell you there is, and some there is not. Pyrethrum is a good remedy. This year we experimented on a large scale with currant-worms, and we find that they can be killed for \$5 per acre.

N. Ohmer inquires about the composition of slug-shot.

Mr. Weed: It contains from one to two per cent. of arsenic, in the form of arsenious oxide.

B. F. Albaugh asks if there is any method of destroying the snowy tree-cricket, or preventing its injuries.

Mr. Weed: We know of no other than cutting out and burning the affected branches in which its eggs are deposited.

Mr. Cushman: I would like to ask Mr. Weed with regard to the use of London Purple, and Paris Green, for the curculio. Is it successful, and how does it kill?

Mr. Weed: I worked on that subject, last summer. I tried it on cherry trees, and found that on untreated trees, 15 per cent. of the cherries were injured; on the treated trees there were but three per cent. injured. The curculio is killed by eating the leaves and fruit upon which the poison has been sprayed. Professor Cook, and one or two others have also obtained good results.

L. B. Pierce inquires if it has been observed that the codling moth has any apparent preference for particular variety of apples.

W. R. Lazenby says he thinks varieties having an open calyx are more subject to its attacks.

L. B. Pierce says he has been troubled by honey-bees perforating and injuring peaches.

Prof. Weed says he does not think honey-bees perforate the skin of sound peaches; they only work where the insects or birds have been at work before them.

J. S. Snider thinks bees do sometimes puncture his grapes.

W. C. Harris raises both bees and grapes, and has seen nothing to induce the belief that bees injure his grapes; says he believes squash-bugs do the mischief, but gave no reason for the faith which was in him on that subject.

President Tryon: Bees may, in some instances, eat grapes, but they do not often do so, and it can hardly be said to be demonstrated that they ever puncture the skin of a sound grape, and the weight of evidence seems to be against it.

Secretary Campbell said he had at one time raised bees, and a good many others were raised in his vicinity. He had endeavored to test the matter, and had never been able to discover that a bee punctured or injured a sound grape; but after grapes were punctured by other insects or birds, the bees would suck out the juices of ripe and sweet grapes, leaving nothing but skins and seeds. He had experimented by putting ripe, sound Delawares upon the shelves upon which the hives were standing, and they would remain untouched. Clusters, also, which had been pecked by orioles, and which were covered with bees, upon being protected by netting excluding birds, but leaving free access to the bees, would be abandoned by the latter as soon as the broken grapes had been sucked clean, and the grapes whose skins were unbroken would remain untouched for weeks, and until dried up on the stems. These experiments satisfied him, that bees in his section do not attack sound grapes. Orioles, robins, cat-birds, and sometimes the brown-thrush, were the marauders for whose work the bees got the credit, although they simply utilized the juices of the injured grapes, that would otherwise be wasted.

Mr. Branson raises bees, and does not like to have them misrepresented. He has also watched them closely, and does not believe they ever puncture sound grapes, and even if they did, they much more than repay the horticulturist by their agency in distributing the pollen from the blossoms, and aiding in fertilizing our apples, pears, strawberries and other fruits.

L. B. Pierce, of Summit county, made some remarks upon Forestry, speaking from written notes, of which the following is his report:

"He thought it useless to urge farmers and horticulturists to plant trees for forest purposes on arable land. A man who could sow oats in April and sell the product in August, or plant strawberries in August and market the fruit in the succeeding June, would not be easily induced to plant trees, so that his great-grandchildren might run a portable saw-mill. Private forestry could only be successfully urged to the extent of growing trees for posts, and other farm uses. Probably private forestry would take the form of planting wind-breaks of suitable varieties of trees. He did not think black-walnut and catalpa come under this head. For posts, the best trees are locust and osage-orange. The latter is one of the most durable, and yearling seedlings planted in a single row, two feet apart, on rich land, would average two posts to the tree, in twenty years.

It makes a compact, close screen, and is, perhaps, the best deciduous wind-break that can be planted. For small uses around the farm, such as whiffle-trees, handles, binding-poles, etc., there are two trees pre-eminently suitable, because of their strength, and the fact that they have no useless sap-wood, and rapidity of growth does not injure the texture. These are the shell-bark hickory and the white-ash. Much can be gained in timber growth by allowing stumps to sprout. The roots already existing accelerate the growth wonderfully, and the sprouts rapidly grow into tall, straight trees. He knew a chestnut-stump, two feet in diameter, that has nine sprouts, which now, after twenty-five years' growth, exceed twice, in bulk, the original tree."

Mr. Farnsworth said he had planted a row of Catalpas, eight or nine years ago, about two feet apart, which now stood six to eight feet above the ground. He thought it a valuable tree.

Mr. Pierce asks what the timber from Catalpa is good for? He had seen it stated that the timber from the old fort, that had been so often mentioned, was mulberry.

Leo Weltz asked what Catalpa was planted by Mr. Farnsworth? Is it speciosa?

Mr. Farnsworth thinks it is.

Mr. Weltz says if it is Catalpa speciosa, he believes it will do well about Toledo. He is a young man yet, and is still planting Catalpas. He has faith in it as a valuable forest-tree, and from the best information he can get, thinks it will take the place of the locust. As to the ash, Mr. Pierce is right. It is a good tree for many purposes, and can be all used—there is no waste. He has grown ash lately—or, rather, saved it—did not cut it out. Catalpa, however, is his favorite. Timber-merchants were around last summer, buying up young, second-growth hickory, elm, etc., at \$16.00 per cord, to ship to California. The elm is used for wagon-hubs.

A member said it was the "hickory-elm."

W. C. Harris: We have swamp-elm, rock-elm and red-elm. Rock-elm and hickory-elm are the same.

B. F. Albaugh asked for information as to the best trees to plant for a wind-break.

Mr. Adams recommended the Norway Spruce. He would plant them zig-zag, six feet apart.

Mr. Albaugh asked if the lower limbs would not die, if so planted.

Mr. Adams replied not, unless the trees were planted too close together.

Vice-President Lazenby spoke of the different habits of growth of individual trees of the Norways. Some were slender, others more stocky and compact. There might also be two forms—male and female. There was also very likely a difference, owing to the very common variation in trees grown from seeds.

W. C. Harris doubted if the planting of wind-breaks would pay; they take up a good deal of ground, and nothing could be profitably grown near them.

Vice-President Lazenby said the Ohio State University had secured the Meehan collection of woody plants, from the Centennial exhibition, which contained 764 varieties. They had also six acres of primitive, native trees, consisting of oaks, elms, hickories, birch, etc., which he hoped would be carefully guarded and saved. There are thirty species in the lot.

F. R. Palmer said he had three, apparently distinct kinds of Norway Spruce, in a lot planted many years ago. Some are tall and open; others short and stocky, some large and some small. There is a good deal of diversity in the appearance of the trees, all regarded as the same variety.

On motion, the meeting adjourned until 7 o'clock P. M.

THURSDAY EVENING, *December 13, 1888.*

The meeting was called to order at 7 o'clock, by President Tryon, who announced the first thing in order to be the report of the Committee on Exhibits, but as a great many of the members had not yet arrived, the unfinished business of the last meeting would be taken up. The first subject is the Blackberry. Which of the cultivated varieties can be recommended for general garden planting, and which for profit in market?

Some discussion was had upon the merits of the Early Harvest Blackberry, which has not been generally planted. The impression was, that it could not be recommended for general planting in Ohio. It is early, of good size, and of good quality, but fails in hardiness. In most places where tested has been found to winter-kill.

Member: With me, Snyder is the best blackberry I ever had anything to do with. I never mulch it, but I cultivate it continually. Stone's Hardy does very well, so far as bearing and quality are concerned, but it is rather undersized. With my experience, I feel that Snyder is good enough for anybody.

W. W. Farnsworth: My experience with the Taylor is somewhat varied. About 1880, I set out a row of them on high, thin sand, and gave them a top-dressing of manure each year, after coming into bearing. The result was, that they bore heavy crops every year until cut down in 1887, on account of being in the way. In 1884, we set four acres of rich, sandy ground, to blackberries, about half of them being Taylor; but we have never got a good crop from them yet.

E. H. Cushman: I saw Mr. Farnsworth's berries this fall, just after they had fruited, and if I have the true Taylor, he has not, for his vines

have an entirely different appearance from mine. I bought the Taylor of A. M. Purdy, and received two varieties; one had a red cane and the other a green cane. I think the green is the true Taylor. It has not been a regular bearer in our section. The quality is good, to best.

N. Ohmer: I will say a few words on blackberries. I have tried many varieties, but I never tried the Early Harvest. The Lawton has done well for ten or twelve years, and I have them still this year I had an immense crop of large berries. I also planted three acres of the Taylor blackberry, and the last year they were not very satisfactory. This year, however, they bore an immense crop of the largest, handsomest berries I ever saw; they were also excellent in quality, and I never saw any like them; they brought me more money than any other variety. Give me the Taylor and the Snyder, and I do not want any other berry.

T. Munger: Has any one experimented with the Wallace blackberry?

T. E. Longenecker: It is a berry of the best quality, but not productive enough.

W. C. Harris: As far as my experience goes with blackberries, I prefer the Kittatinny. I have had good crops the last three seasons, but two seasons previous, they dried up. I like the Kittatinny better than the Lawton, because they are a little earlier. I am pretty well satisfied with them.

Mr. Ohmer: Where Kittatinny does well, it is an excellent berry. How about the Erie and Minnewaski? Has any one fruited either of them? I think Professor Green can tell us about these berries.

Mr. Pierce: I have fruited the Erie for about ten years. It is the largest berry I have grown, and it only failed to bear twice since I discovered it, twelve years ago. I am growing it under cultivation, now, and it is doing nicely. For an extra-fine berry for table use, I prefer the Erie.

Mr. Green: I believe on the lake shore, they could plant the Erie successfully. It is a very large, fine berry; but, as I have said before, I give the preference to the Snyder, Agawam, and Taylor. I like the Ancient Briton very much, for it is a good grower and productive.

Member: Is it earlier or later than the Snyder?

Mr. Green: There is not much difference.

Member: How does it compare with the Agawam, in size?

Mr. Green: There is but little difference between it and Ancient Briton.

Mr. Cushman: I see our Committee on Fruits has come in, and perhaps we had better have their report.

President Tryon: The first thing in order, this evening, was the

report on fruit-exhibits, but the committee was not present. We will now hear their report.

Mr. Trowbridge, chairman of the committee, then read the report of the Committee on Exhibits:

REPORT OF COMMITTEE ON FRUITS.

Hurst & Hurst, Chillicothe, Ohio, favors the Society with a very extensive and commendable exhibition of apples, true to name, so far as the committee can determine. Among upwards of sixty varieties, we notice some old, prime favorites, viz.: American Golden Russet, Evening Party, White Winter Pearmain, and Newtown Spitzenberg (Ox Eye). Also, their long-keeping Chillicothe, named as such by this Society. Also, Wagener, Stark, Rome Beauty, King, Fallawater, Baldwin, and Ben Davis, were especially striking. A seedling, heretofore exhibited and reported upon, but not named; one large, yellow sweet apple, supposed to be Loudon Sweet; two large, red seedling apples for examination; and one flat, yellow apple, a supposed seedling. We feel constrained to compliment the exhibitors for their zeal and interest in the welfare of the Society, by bringing together such a collection, simply for exhibition.

I. Freeman exhibits eight varieties of apples, good specimens, and characteristic types, viz.: Jonathan, Rome Beauty, Ben Davis, Twenty-ounce (Cayuga Red Streak), Minkler, Park Spice, Wine-Sap, and Grimes' Golden.

N. Ohmer, Dayton, Ohio, shows his usual interest in the Society by bringing a collection of apples; among them the beautiful Lady; also Hewes' Va. Cider Crab; Smith's Cider, Rawles' Janet, King, Baldwin, Northern Spy, Minister (latter for name), Rome Beauty, and one large, showy apple for name, may be Miller.

J. Peirce, of Troy, Ohio, exhibits one plate of pears, Vicar of Winkfield, unusually large and fine; eight plates apples: Yellow Newtown Pippin, handsome and smooth; English Russet, Jersey Black, Wagener, Yellow Bellflower, King, Tallman Sweet, Celestia, Fall Pippin, and Peck's Pleasant.

E. H. Cushman, Euclid, Ohio, makes a most beautiful and attractive display of Grapes for so late in the season, and number some of our best varieties. The following is the list: Lady Washington, Iona, very fine; Vergennes, attractive; Jessica, Martha, Catawba, Pocklington, Triumph, very large clusters; Wilder, Salem, Concord, Delaware, Duchess, Empire State, Brighton, well-preserved; Diana, Worden, Ulster, Lindley, Jefferson, Wyoming Red, and Norton's Virginia. Also, Grimes' Golden Apple. Among Pears, are Sheldon, Lawrence, Vickar, d'Anjou, very large; Winter Nelis, Keiffer, and d'Angouleme, two plates, one of them New York grown.

W. L. Perry, Covington, Ohio, exhibits several plates apples, among them: Wealthy, good specimens; Clyde Beauty, White Pippin, Perry Sweet Russet, probably a local name; Missouri Pippin, probably not correct. Another for name, probably Washington Sweet.

Geo. W. Trowbridge, of Glendale, Ohio, exhibits, seven varieties of pears, viz.: Anjou, Lawrence, Mahoning, Clairgeau, Winter Duchess, Duchess de Bordeaux, and Easter Beurre. Four varieties of apples: Green Newtown Pippin, Jonathan, White Pippin, Ohio Pippin (Shannon of Arkansas). Also fine specimens of the Champion Quince.

John W. B. Youtsey, of Troy, Ohio, exhibits six varieties of pears: Duchesse d'Hiver (Winter Duchess); Figue d'Alençon, Josephine de Malines, Glout Morceau, Winter Nelis, and Easter Beurre, all prime and choice winter varieties.

Leo Weltz, of Wilmington, Ohio, exhibits three varieties of the Japan pears, Mikado, Sieboldii, and Sand Pear. Also, the large, showy Duchesse d'Hiver, and several seedling apples, a cross of Ben Davis and Duchess of Oldenburg.

President H. G. Tryon exhibits seventeen varieties of apples: Fall Pippin, Rhode Island Greening, Red Canada, Grimes' Golden, Roxbury Russet, Ohio Pippin, Lady Sweet, Wagener, Rome Beauty, Rambo, Northern Spy, Baltimore, Fallawater, Baldwin, King, Rawle's Janet, Peck's Pleasant.

E. M. Buechley, of Greenville, Ohio, exhibits a plate of a beautiful, blushed apple resembling the Maiden's Blush, claimed by him to be a seedling; and a winter apple. The committee believe it so nearly resembles the Winter Maiden Blush, described by Downing on page 413, revised edition, that your committee could not recommend it as a new and valuable variety.

John W. B. Youtsey, of Troy, Miami county, Ohio, exhibits a new seedling apple, from seed of the Yellow Newtown Pippin, planted by himself some sixteen years since. The tree came into bearing in about eight years from planting. He states, it is a regular and abundant bearer. The fruit is of a very tender, rich, mild, sub-acid flavor, and we recommend it to the Committee on Nomenclature for a drawing and description and name, if worthy.

J. H. Britton, of Painesville, Ohio, sends three varieties of pears for exhibition, which are beautiful and perfect types of each variety, and numbered among the most valuable of the winter ones, viz.: Lawrence, d'Anjou, and Josephine de Malines.

Frank Harlan, of Canton, Mo., sends the Shackelford apple, medium to large size, fine color, and attractive, fair quality. Further information desired, before we can recommend the same for general planting.

W. H. RAGAN,
LEO WELTZ,
GEO. W. TROWBRIDGE.

President Tryon: The next thing in order is the paper by Professor W. R. Lazenby, on some lessons from the chemical composition of fruit, and fruit-plants.

SOME LESSONS FROM THE CHEMICAL COMPOSITION OF FRUITS AND FRUIT-PLANTS.

BY PROF. W. R. LAZENBY, OF COLUMBUS, OHIO.

We live in an eminently utilitarian age. The energy of our people is mainly expended in the production, manufacture, and distribution of articles that nourish the body, gratify the senses, or in some way contribute to the comfort, and convenience, of mankind. Mind is steadily dominating matter, and this extension of the sovereignty of man on the earth, we call civilization.

The art of Horticulture consists in transforming, by means of cultivation, crude and worthless materials into substances mainly useful as wholesome food products. These raw materials are furnished by the soil, and such substances as may be added thereto, together with certain elements of the air, and of water. Progress in the art of Horticulture, means an ever-increasing insight into, and a better understanding of, those laws which govern the desired transformation. It means a better knowledge of how plants grow, and how they feed.

The sciences of botany, chemistry, and geology, have all contributed much toward this end. Of the three sciences named, perhaps chemistry plays the most important part, being most intimately connected with, and concerned in, these changes in material substances, which the Horticulturist is constantly endeavoring to effect.

The first great lesson taught by chemistry was, that matter can neither be created, nor destroyed. It proved that every minutest particle of the fruit-plants of our gardens and orchards, roots and branches, wood and bark, buds, blossoms, and fruit, all come

from pre-existing matter, found in other forms in soil, air, and water. The growth of an apple-tree is simply transformation, not creation. Burn the tree, and the chemist's proofs are equally conclusive that all the component parts are in the gas, smoke, and ashes, ready to be transformed, or assimilated, into another tree. We know, therefore, that no finite power can either create, or annihilate, a single particle of matter. This was one of the earliest lessons taught by chemists. Coming to one of the latest, and no less important lessons, it is the complete overthrow of a supposed definite distinction between organic and inorganic matter. The artificial production, by the chemist, of any organic compound whatever, appears to be a mere question of time and skill. It is almost safe to predict that chemistry will ultimately succeed in generating every organic substance now known.

It may be doubted, however, if it can ever go much further. Science may be able to form sugar, pectose, tartaric acid, and all the ingredients of a grape; it may produce, in like manner, the starch, cellulose, vegetable fibrin, etc., found in the potato; but when all this has been done, it will be as impossible as ever, to artificially produce a single cluster of the Concord, or a peck of Early Ohio.

There are three minor, though none the less practical lessons, drawn from the chemical composition of fruits and fruit-plants, to which I desire to call special attention.

These are as follows:

- 1st. The needs of the soil, for profitable fruit production;
- 2d. Some ulterior benefits to be derived from thinning fruits; and
- 3d. The advantages of fruit as a part of our every-day diet.

It is well known that every plant, large or small, herbaceous or woody, annual, biennial, or perennial, is composed of certain elements, or compounds, whereof by far the larger portion comes from the atmosphere; a much smaller, though constant, and no less essential portion, coming from the soil. The elements which are absorbed or imbibed from the atmosphere, are usually found in abundance, and are yielded freely to all growing plants. If the roots are duly supplied with mineral and nitrogenous substances, together with a sufficiency of moisture, the rapid and perfect development of leaves, the organs of atmospheric absorption, will secure whatever can be obtained and is needed, from the air.

Hence, the really important question is this: Are the necessary elements that are furnished by the soil, usually present in such quantities, and under such conditions, that the wants of the plant are supplied? In answer to this, I believe it can be safely asserted that there is not a single square rod of land, anywhere within the borders of the State of Ohio, so rich in all the elements of available plant-food, that the production therefrom, of fruit or vegetables, could not be increased by some application of fertilizers. The intelligent, practical horticulturist cannot fail to ask himself the following questions:

- 1st. Wherein is my soil originally deficient? and,
- 2d. Upon what elements have the largest drafts been made by subsequent cropping?

Can chemistry help us to an answer? Let us consider. We may not have much to hope from the analysis of soils, and it is doubtful if this will ever do more than furnish possible hints as to what may or may not be required. We do know, however, that the analysis of plants and fruits furnish excellent guides, as to what can be profitably added to different soils, as fertilizers.

To illustrate. The stems, branches, and leaves of different fruit-trees contain comparatively large quantities of lime and potash—substances that are not unfrequently lacking in our soils. In fact, I have never yet seen an orchard, nor fruit-garden, the productive capacity of which could not be improved by the application of some one, or all, of these compounds. I doubt if there is an acre devoted to the production of fruit, that would not amply reward an application of fifty bushels of unleached, hard-wood ashes, at twenty-five cents per bushel. In many, though probably not in all localities, an equal amount of lime would give proportionally good results; and, in some localities, even better.

Chemistry tells us that our fruits, especially those that bear seed, contain a considerable amount of phosphoric acid, and that this compound is not unfrequently lacking in our soils.

An average of several trustworthy analyses of the seeds of the grape, give in every 100 parts of the ash, 29 parts of potash, 34 parts of lime, and 24 parts of phosphoric acid.

Average analyses of the ash of the entire fruit of the apple, pear, cherry, and plum, resulted as follows :

In every 100 parts, there were in the—

	Potash.	Lime.	Phosphoric acid.
Apple.....	36	4	14
Pear	56	8	15
Cherry	52	8	16
Plum.....	60	10	15

From this, it seems plain that the roots of our fruit-bearing plants and garden vegetables must be duly supplied with these mineral ingredients. These three substances named above, together with nitrogen—which can only be taken up by the plant in the form of ammonia or nitric acid—must be in some way furnished to the roots of all growing plants. The farmer's, gardener's, and fruit-culturist's partiality for barn-yard manure, in preference to most, if not all special, commercial fertilizers, is because it is, when well made, an almost complete plant-food, a large portion of which is in an immediately available form—nitrogenous, as well as mineral. Next to farm-yard manure, according to the teachings of chemists, unleached wood ashes is probably the best fertilizer for fruit-gardens and orchards. Lime, probably stands next, where the soil is deficient in this element; and phosphates, or fine-ground bone, whenever your soil has become despoiled of phosphoric acid. I speak less confidently of the use of gypsum and salt, from the teachings of chemistry. From the stand-point of the entomologist and mycologist, however, the latter is undoubtedly useful, and this compound may often be applied with equal satisfaction and profit. That salt is a stimulant to the growth of some plants—like asparagus, for example—is well known. While it does not serve as a direct food, it is an excellent disinfectant, arresting decomposition, and keeping the roots in a healthy condition. We all know something of the power of salt as a preservative. It is an excellent fungicide and insecticide, but must be used with great caution. On many soils, a mixture of refuse salt, lime, and muck, would prove one of the best and cheapest fertilizers that could be applied.

The second lesson, viz.: the ulterior advantage of thinning fruit, I shall scarcely more than hint at. I say ulterior advantage, because we will all admit that the most direct and palpable gain from thinning, is in the increased size and enhanced marketable quality of our fruit. Chemistry informs us, however, of another benefit that ought not to be overlooked. An examination of numerous specimens each, of large and small apples, of several different varieties, showed that the weight of seed was not at all proportional to the weight of the fruit. In many, in fact, most cases, the total weight of the seeds in the smallest perfectly developed apples was but a trifle short of the weight of the seeds of the specimens of the same variety that weighed two or three times as much. In other words, a given weight of fruit, of the medium-sized, or moderately large apples, contained only one-half as much seed as an equal weight of the same variety, composed of twice the number of specimens, did. Chemistry informs us that about 85 per cent. of the mature fruit of an apple is water, and that a very large per cent. of the

mineral ingredients is found in the ash of the seed. It is obvious, therefore, that if we wish to make as slight a draft upon the soil, or upon the vitality of our fruit-plants, as possible, we should aim, not so much to diminish the total weight, as to diminish the seed, by increasing the size of the individual specimens.

In the case of our small fruits, a selection of varieties, with a comparatively small seed product, would probably give the same result. Take, for example, the analysis of the Turner and Ohio raspberries, made a year ago, by Prof. Weber, of the Experiment Station. The former was found to contain $84\frac{1}{2}$ per cent. water, and $15\frac{1}{2}$ per cent. solid matter. The latter contained 80 per cent. of water, and 20 per cent. solid matter. Of this solid matter, in the Turner, a little less than 34 per cent. was seeds. In the Ohio, there was over 55 per cent. of seeds. In other words, the $5\frac{1}{2}$ parts in every 100 of the total weight of the whole fruit of the Turner, was seeds; while 11.16 parts in every 100 of the Ohio was seeds, the Turner having less than one-half the amount of seed found in the Ohio. These figures may not show which variety of the raspberries in question is the more profitable in the market, but it does show which is the more exhausting to the soil, and which is the more profitable for the consumer. It seems more than probable that the judicious thinning of our small fruits by more radical pruning, or by the removal of a portion of the young fruit as soon as it is set, would not only give better immediate results, but would delay the exhaustion of the soil, and prolong the life of the plant.

The third topic—the advantages of fruit as a part of an every-day diet, is one that chemistry sheds much light upon. Our rosaceous fruits, together with the currant, gooseberry, and grape, contain the following substances in greater or less proportions:

1. A large per centage of water.
2. *Sugar*, in the form of grape or fruit-sugar.
3. *Free organic acids*, varying according to the kind of fruit—malic in the apple, tartaric in the grape, citric in the lemon, etc.
4. *Protein, or albuminoids*, substances containing nitrogen, which resemble the white of eggs, and are equivalent to it in food-value.
5. *Pectose*, the substance which gives firmness to fruit, and which, upon boiling, yields various fruit jellies.
6. *Cellulose, or fibre*, the material which forms the cell-walls, which is found in all parts of plants (mineral salts).

The substances named above are, with the exception of the cellulose, essential constituents of a perfect diet. But the two qualities that render fruits especially wholesome, and cause us to crave them for their taste, are juiciness and flavor. The juice is mainly water, but it comes in a grateful and refreshing form. The flavor is due to the presence of the organic acids already mentioned, together with certain volatile oils and ethers. Chemistry and physiology both teach us the important dietetic effects of these materials. When taken into the body, they undergo oxidation, which process tends to lower the temperature of the blood, thus correcting any slight tendency to a feverish condition which may exist. They also tend to keep the organs of secretion—liver, kidneys, etc.—in a healthy condition. In our climate, subject, as we are to great extremes of temperature, having an arctic winter and a tropical summer, and passing, as we often do, abruptly from one to the other, the system is naturally debilitated; and in this condition we are predisposed to malarial troubles, particularly if we live where the drainage is poor. Fruit, on account of the free acid it contains, is a great corrective for this general debility. The acids are antiseptic. They tend to destroy disease-germs that may have found a lodgment in the body. The beneficial effects of these acids may be partially overbalanced by the indigestibility caused mainly by the coarse and hard condition of the cellulose. But when fruit is perfectly developed and properly matured, the cellular tissue is soft and fine, so that even with the aid of a good microscope we cannot easily detect the walls of the individual cells.

We know that unripe fruit is not wholesome. It does not digest, but ferments and decomposes in the stomach, and is the cause of serious disorders. This may be still more true of over-ripe, or partially decayed fruit. If it is unwise to take into our bodies that which will decay and ferment, it is certainly no less unwise to use fruit in which these changes have already begun. The question is often asked, whether such or such a fruit is "healthy." This is bad English, unless you have special reference to the condition of the fruit itself. It is safe to say, however, that the teachings of chemistry, as well as our own experience, show that "healthy" fruits are *wholesome*, and the best results possible from its use as food, is to eat fresh, matured fruit, that is the product of your own skill and industry.

President: The next thing in order is the report of the Entomologist, Professor E. W. Claypole. He is not present, but his report is in the hands of the Secretary.

ENTOMOLOGICAL REPORT FOR 1888.

BY E. W. CLAYPOLE, OF AKRON.

The codling-moth has been, as usual, very destructive this season. Indeed, it seems as if the ravages of this insect were largely on the increase, if we may judge from the prevalence of spoiled fruit among our apples and pears. I am glad to say, however, that there are signs of an awakening to the importance of taking some steps to counteract this pest of the orchard. Several farmers are beginning to employ what seems to be the most effective remedy—the spraying of their trees. One of these, whom I questioned, told me that the only fruit in his orchard that really was good, was gathered from trees that had been thus treated. He did it this year only as an experiment, but next season he intends to repeat the experiment on a larger scale.

A conspicuous difference may be observed this year in the numbers of the various kinds of Aphids. The wet season is probably the cause. Last year the summer was hot and dry, and in the late fall, every cabbage-leaf was covered with the cabbage plant-louse. This year there are few to be seen. I have only seen them on the black mustard, but my observation has not been very extensive.

Though a considerable amount of alarm has been felt, lest the dreaded chinch-bug should over-run Ohio as it has over-run several states to the west and southwest, yet thus far there has been comparatively little mischief done here by this terrible enemy of the farmer. Reports have come to hand of some amount of damage to crops in certain parts of the State, but the districts so injured are small and isolated. There does not seem to be, at present, any real cause for alarm from this source, for, at any rate, the greater part of the State. The hot and dry season of 1887 gave the insect an impetus which the cooler and moister summer of 1888 has apparently done much to check, and we shall probably hear less of the chinch-bug in 1889 than we have heard this year. At the same time, as prophecy is proverbially dangerous, unless it is made after the event, it will be wise if farmers and fruit-growers will familiarize themselves with the appearance and habits of this insect—a plague which comes nearer to being omnivorous than any other, excepting, perhaps, the Rocky Mountain locust.

This report is not so detailed as it should be, because your reporter has been absent in England and on the Continent of Europe for the greater part of the season. There is a great awakening among farmers on the other side, respecting the importance of entomology to their interests. Less has been hitherto done in that direction there than here, because the cooler and moister climate confines the mischief wrought by insects within narrower limits. The intense heat of the North American summer, develops insect-life to a degree totally unknown on the other side. Nowhere can so many be seen. Grass-hoppers, house-flies, gnats, codling-moths, currant-worms, cabbage-butterflies, and many

other pests exist there in insignificant numbers, while several are totally unknown. Among the latter may be mentioned the plum-weevil, our very worst fruit-foe, and the potato-beetle.

Miss Ormerod, the Entomologist to the English Privy Council, has done much to awaken this interest, and last year called attention to the prevalence of the Hessian fly, for the first time in England. It has long been known on the Continent of Europe, but the English climate seems unfavorable to its increase, though it caused some alarm in certain parts of the country, last year. This season, I believe the mischief has been slight. It would be well if farmers here would take alarm at the loss which this insect inflicts upon them, year after year, and try to save that percentage which the fly exacts; for this enemy is a hard tithe-taker.

Regarding the introduction of the fly into America, it may be worth while to remark that in all probability we may rely on the old story, that it came in with the Hessian troops, in 1776, on Long Island, and its existence here is therefore coeval with that of the Republic. Many assertions of its earlier occurrence here, have been put forward, and some of them on apparently good authority. They have, however, proved untrue. Even the quotations recently published from the Proceedings of the American Philosophical Society, which seemed to definitely mention it in 1768, turn out, on careful reference, to be incorrect, and refer, almost without doubt, to the Angoumois Moth. At all events, they certainly do not relate to the Hessian fly. Consequently we have no mention of it before 1776, and its rapid spread after that date confirms the belief that it was then introduced.

While in Paris, I spent much time in the Jardin des Plantes, and among many objects of interest, I observed the fine avenue of Lindens that runs through the middle of the garden. Their leaves were brown and dead, and a large part of them were on the ground in August, when they should have been at their greenest, especially in so cool and moist a season as the present. On examination, I found that the trees were swarming with Aphids, which, by sucking out their juice, were destroying the foliage, and producing the early fall. On inquiry, I learned that the mischief had been going on for years, and that no remedy had been found of any value. The Directors had consequently resolved to let them alone, and as they died, to re-plant the avenue with horse-chestnuts and Oriental Plane-trees, which, being foreign to the country, can be grown without becoming subject to the attacks of native foes. As the trees are very large, the new remedy of spraying might not be successful, especially as the spray must be thrown with great force to reach these insects. It would also be very expensive.

The principle, however, of growing foreign trees, in order that they may escape the attacks of our native foes, is worth recollection, as it is likely to succeed, at least, unless chance introduces, and the climate favors, the depredator.

ADDITIONAL REPORT ON ENTOMOLOGY.

BY E. W. CLAYPOLE, OF AKRON, OHIO.

The plum-weevil, as usual, is abroad this season, and apparently, in undiminished numbers. I have taken pains to examine its work, and I believe the plum crop is practically destroyed in this (Summit) county. Many of the trees are fruitless, the plums being already on the ground. I recently counted on one plum, twelve crescent-shaped marks of the weevil's beak. But I found also, that in a very large number of cases the egg was dead and the wound had healed. In such an event, the only trace left on the fruit is a small, rough, russety mark, whose cause, when the plum is ripe, could only be guessed. But in spite of this fatality, the cause of which is not clear, few plums have escaped, because the eggs are so numerous.

Cherries are in the same condition. Of early kinds, there are very few—most having been killed in the winter. Of late kinds, the crop is not great, and there are

not enough to supply one for every weevil. They are, consequently, riddled with punctures, and will be of little value.

I have not been able to see that the use of poisonous spray has made any difference. One tree, which I carefully examined, and which had been treated with London purple, did not show a sound cherry. The results, thus far, do not commend the process to the practical plum and cherry-grower, as an effective check to this, the greatest of our insect foes. Experiment seems to show some result, but scarcely an encouraging one. It is true that the weather has, this year, been hostile to good effects. Constant, heavy showers have fallen almost every other day, so that the poison, if put on, may well have been washed off again. At the same time, it is very difficult to understand how the excessively minute quantity of arsenic distributed over the foliage and fruit of the tree can destroy a beetle that does not eat either, but merely pushes its snout through the skin and sucks the juice from inside. It is, of course, possible that the powder may be unpleasant to the insect, and so deter it from laying eggs there, but this is not the result claimed by the advocates of the process.

In the case of the early cherries, there is another objection that requires consideration. The time that intervenes between the blooming and ripening is so short, that in a dry season it seems scarcely possible that the whole of the arsenic can be washed off. Evil effects might follow the eating of the fruit.

The scarcity of cherries and plums is apparently driving the weevil into the orchards, and I find abundant evidence of their work on the apples. I know it is claimed by some, that much of this mischief is due to another species—the four-humped weevil (*Anthonomus quadrigibbus*). But my own observation is opposed to this. I have carefully examined the fruit for several years, and am yearly more confident that the author of the mischief is really the plum weevil (*Conotrachelus nenuphar*). I have seen the four-humped weevil busily at work on its own proper food-plant, the hawthorn tree, and have captured it in the very act. It pierces the berry with its snout, both for food and oviposition, so that the berries are dotted over with black spots. But it never makes the crescent-shaped marks of the plum-weevil. I have also gathered many apples showing this characteristic cut, but not a single one indicating the work of the four-humped species.

Nor have I seen any reason for suspecting the latter of doing mischief later in the season, when the plum-weevil is very injurious by picking the skin of the nearly ripe fruit, to suck its juice for food. The minute hole thus made is one of the most fertile causes of that specking and rotting by which much fine fruit is destroyed. For it may be accepted as generally, if not universally true, that this rot never sets in unless the skin has been broken or perforated.

In regard to spraying for the codling-moth, the reports are rather more favorable. But here, also, it is very difficult to understand how the insect can be poisoned by the very minute quantity of arsenic deposited on an apple. Any one who will examine the young fruit, will see that the dead stamens and style form with the calyx an almost impervious barrier against the entrance of the liquid. It is equally difficult for the moth to enter and lay the egg. I have never seen an egg inside an eye on the skin of the fruit, and it seems probable that the egg is usually laid on the outside, and that the caterpillar when hatched, crawls inward. If this is so, any protective effect of the spraying must be referred to a dislike on the part of the moth to the powder and its consequent avoidance of the sprayed trees.

It is worthy of remark, though not new, that this larva seldom comes to maturity in the apple, pear, quince or peach, perhaps in consequence of the slower maturing of their fruit, though a constant succession of eggs follows through the summer. We have here a case of mistaken instinct, as when the flesh-fly lays her eggs on the carrion plant. I have traced many a larva into its mine in these fruits, but never one of them out again. Still, the effect is not less injurious. Our knotty, gnarled, and misshapen fruit, bears testimony to the loss which this miserable little wretch yearly inflicts upon us.

I have heard, as usual, many complaints of the biting of pieces out of small apples so as to injure or ruin them. This mischief is, I believe, mostly due to the cock-chafers, or June beetles (*Lechnosterna fusca*). Their jaws are powerful enough to do it, and the deed is done just when they are most abundant. This is circumstantial evidence, it is true, but many a man has been hanged on weaker testimony.

But if the evidence against the cock-chaffer is circumstantial, that against the rose-beetle (*Macrodactylus subspinosus*) is direct. I have seen these insects, with their jaws and heads buried in the fruit of the cherry and the apple; sometimes five on a single fruit. They also devour the foliage of these trees, riddling the leaves with holes. They are almost omnivorous. I have seen them on the vine, the plum, and the quince, as well as on the others mentioned above, in all cases defoliating them more or less. By the united mischief of the two insects—the plum-weevil and the rose-beetle—the fruit crop is totally ruined in many orchards in this part of the Reserve. I speak more particularly of Summit, Portage, and Columbiana counties, where I have made careful observations. Few apples can be found, that are not lop-sided or gouged by these pests.

Were it not for their mischief, the apple-crop, though not large, would promise well. The codling-moth is, this year, singularly scarce in this region. I have scarcely found a half-dozen wormy apples, and have not seen a single moth. To what this scarcity is due, I cannot say. But it should be borne in mind by those who spray their trees, lest they attribute its absence to the wrong cause. If the spraying is effective in averting the other two insects here mentioned, it is worth doing. The rose-beetle may readily be poisoned, because it actually eats the apple, but, as already stated, it is difficult to see how the same can occur to the plum-weevil.

I have to report the presence of the asparagus-beetle (*Crioceris asparagi*) in Columbiana county. Possibly its occurrence may not be new, but being away from home, I cannot refer to my books. I can only say, that I have not seen it in Summit county. In Long Island, this introduced insect has for many years troubled the asparagus-growers, but its limitation is not difficult, though its extirpation seems impossible.

Next in order is the report of the Ornithologist, L. B. Pierce.

REPORT OF ORNITHOLOGIST.

BY L. B. PIERCE, OF TALLMADGE, OHIO.

MR. PRESIDENT AND FRIENDS: Those of you who have read the last annual report of this Society may have noticed a brief paper upon Horticultural Ornithology. To quote the modest language of Bill Nye, in reference to one of his own articles, "I trust you have derived both pleasure and profit in its perusal;" at least, I hope so, because I wrote it in the hurry and worry of strawberry-harvest, and got little of either out of it, myself.

The request to me, at that time, from Secretary Campbell, for a report on this branch of Horticulture, had the effect, I am afraid, of making two bites of one cherry, and a very small cherry, at that. By this, I do not mean that the subject of Ornithology, in connection with Horticulture, is a small one, but that the available material for a comprehensible report, is exceedingly scarce. I have kept a close watch on the columns of fifteen prominent newspapers—eleven of them devoted to Agriculture and Horticulture—and scanned the transactions of a number of prominent Horticultural Societies, and find the meagreness of knowledge upon ornithology the most patent fact in connection with it. Now and then, I have come across a part of a column, bearing upon the matter, and pounced down upon it like a hawk after an August chicken, only to find it the same old lingo about the value of birds to the tiller of the soil, without a single new fact, or any new observations bearing upon old ones. The only new and definite statement bearing upon the thrush family, to which the robin and cat-bird belong, and which family is a source of much loss to the fruit-grower, comes from the pen of Mrs. Mary Treat, of New Jersey, a well-known entomologist, and she states that the robin and brown thrush both dig the

white-grub out of the sod, and in this way keep it in check. Only this, and nothing more, in a whole year, have I been able to find about a family of birds that nest in everybody's orchard, that preys upon everybody's cherries, and is as cordially loved by three-fourths of the population, as it is hated by the other fourth.

The reasons for this dearth of knowledge, in reference to the feathered tribe, are not difficult to find. Many birds are small, active and shy; they gather a considerable portion of their food in the very early morning, and among weeds and bushes and leafy trees, where it is difficult to follow and see. And then, birds bear a very small ratio to the rest of creation. It doesn't take a very large corn-crib to hold 200 bushels of corn; and, big and little, that means about 15,000 ears of corn. If the crib was filled with domestic animals, it wouldn't take a very large stock-raiser to pack such a crib to bursting with horses and cattle, and pigs and sheep, and chickens. I fancy, however, it would take the birds of several townships to fill such a crib, even if we included the crows and hawks. I saw in Chicago, the other day, a basket of English sparrows, divested of their feathers, and tied by their little, black, shiny feet, in bunches of a dozen, and the bunches were about the size of a thick, flat turnip, about $3\frac{1}{2}$ inches across, and it would take no less than 90 dozen, to heap a bushel basket. The American sparrows, the wrens, tit-mice, finches, and some of the swallows, are still smaller than the English sparrow, so we see that the birds form a really insignificant part of the material world; and were it not for their melodious or noisy notes, their bright plumage, and the occasional damage they do, they would be as little noticed as the frogs of the swamp, or the mice and chip-munks of the field. To study their habits, one must have a powerful opera-glass, be a good marksman with the shot-gun, and have no squeamish notions about killing an innocent being, or suddenly depriving a young family of the father or mother-bird. Besides, it takes time and patience to watch the habits of birds, to examine their craws, to see what they have been eating, and form just conclusions as to their true value as friends or foes. Such being the case, it is little wonder that the active, busy fruit-grower or farmer is able to add so little to the sum-total of knowledge upon economic ornithology, and that we progress so slowly in this matter. If we are to judge this subject by the kindred science of entomology, we will have to await the investigations of many generations of observers, before a large portion of important facts are actually obtained. The honey-bee has been a subject of minute study and observation for two centuries, but it is yet a hotly disputed point as to whether he is a greater friend or enemy to the fruit-grower.

Having thus shown you the many drawbacks to amateur investigations in ornithology, you will not expect me to announce any extended observations or startling discoveries as accomplished in the last five months, or since the sending in of the paper already alluded to.

Around my home, to which field my observation has been mostly confined, there has not, I think, been more than half as many birds as in the summer of 1887. If, as is claimed, birds and their progeny return to the same locality year after year to nest, then this diminution must be assigned to local causes. I keep two very active, excellent house-cats, and their captures embrace every wild thing eatable, from a nursing mouse, to a full-grown rabbit; and many birds fall a prey to their rapacity. Probably 75 per cent. of young birds fall victims to the house-cats when the nests are within thirty rods of the house. I have always tolerated blue-jays, and last March, eight fine birds were around together, helping themselves freely to corn through the cracks of a rather open, old corn-crib. It is probable that these birds nested somewhere in the neighborhood, although but one pair nested on my premises. If so, and they destroy the eggs of other birds, as I have often seen asserted—but, of which I have been unable to personally satisfy myself—then, doubtless, this would account for a scarcity of young robins and cat-birds.

It seems, however, notwithstanding it would be natural to ascribe the scarcity of robins and other orchard-birds to local causes, as if some more remote cause was the means of it. The same cats were owned the year before, and two pairs of blue-jays nested in the door-yard instead of one. I could not verify my own observations on the reduction of robins and cat-birds more than one-half, by appealing to acquaintances, for

the reason that not one farmer in a hundred observes sufficiently close on such matters, to make the evidence valuable.

One other anomaly I noticed this year among birds. For a number of years, the song-sparrow, or ground-chippy, as called by farmers, has been extremely scarce; but the past June, nests could be found everywhere in young clover, old strawberry patches, and in rank pastures. On the other hand, the chipping-sparrow, or tree-chippy, as it is popularly called, which has in former years been quite plenty, and in going through the raspberry and blackberry patches after the leaves had fallen, nests could be seen every few rods. This year, however, the nests are extremely rare.

These facts, derived from close observation during two successive seasons, go to show how little we really know in regard to the causes that control the increase and decrease of our best-known birds.

It seems to me, that the most that we can do at present, is to generalize from known facts, and study and observe patiently for further information.

There are some points that we can consider as settled, and I will enumerate a few. Everybody knows the blue-bird, that sings so sweetly, and comes earliest of all our summer birds in the spring.

This bird naturally builds its nest in an excavation in a very rotten stump; and its food in the early spring, is grubs, and ants, and bugs, and flies found in old wood, and under rotten bark. I well remember how, when a boy—and we had a huge wood-pile to work up in the spring—how the blue-birds came around and shared with the chickens and smaller wood-peckers, the insects that were uncovered in chopping. The blue-bird was very plentiful in those days, simply because the conditions of nesting and food were highly favorable. Now it is all changed; the stump and rotten wood are gone, and with them a large share of its food; and we never expect to see the blue-bird in abundance again. Forty years ago, my father's farm had twenty acres of girdled timber, and the rotting trees rearing their skeleton arms a hundred feet in the air, were the nesting-place of hundreds of wood-peckers. They would excavate in the rotten side of the tree a large hole, and build their nests therein, and there would be half-a-dozen or more nests on an acre. Their natural food, the different wood-boring grubs, was abundant, and the wood-peckers were numerous in proportion. In the nesting season, if you saw a hole high up in a rotten stub, and rapped the stub with a stick, the probabilities were that a scarlet head and long bill would be protruded, to see what was up, or rather, *down*. These birds' heads were objects of rifle practice by the boys, and though they rarely hit them, yet occasionally they did, and I have seen the dead bird partly hanging from a hole, while its mate mourned around for days. It is hardly necessary to say that the day of the red-headed wood-pecker has gone by, and that nobody's hired-man will again shoot thirty of them from a cherry-tree in a single morning, as I have known it to be done, in years gone by.

On the other hand, robins, and cat-birds, and blue-jays, and English sparrows, are creatures of civilization, and we may expect to have them with us, while fruit, and corn, and angle-worms, and grubs, continue to be products of the soil. If you wish birds in increased numbers, you must banish the city sportsman, and the domestic cat, and surround yourself with evergreen groups, with hedge rows and thick trees, and they will flock to the congenial grounds, to your heart's content. If you wish less birds, make your farm a stamping-ground for hunters, cultivate in goodly numbers the house-cats, and persistently rob their nests of the eggs. The last method, I consider the only humane way of reducing the numbers of such birds as robins, and thrushes, and cat-birds. You may grieve their hearts by taking their eggs, or feeding their newly-hatched chicks to the cat; but this is better than wounding with shot, and leaving the bird to suffer and starve in some unknown place.

Of the English sparrow, I have but little of value to say. They never do me any damage; and the only ones I have ever seen on the place, was a flock of about twenty, that settled down for a few moments, in the back-yard, last March. Within two miles

of Akron, they do some damage to ripening grain, and live on the shocks after it is cut, and I notice that the Experiment Station report complains of their ravages on the farm, near Columbus. It is highly probable that they do more damage than good, and perpetual war will have to be waged against them. There is a State law offering a bounty of ten cents per dozen heads, at present in force; but as far as I can learn, very few have been killed, as yet. I have a copy of an English Agricultural Journal, the *Mark Lane Express*, printed in July, containing a letter in reference to the sparrow, wherein the writer claims he abandoned the raising of wheat a number of years ago, because of this bird. Every means possible is taken by him to reduce this number, and the most successful, is a long trough running away from the barn. In the barn, is a port-hole, in line with the trough, through which the sparrows are shot, as they gather in the trough to eat barley-grains.

Each shot killed from six to twenty, and a number of cats got fat catching and eating the wounded birds that got away.

It seems to me that in this way, and by means of a net, money might be made this winter, in all our villages and cities by making war upon the English sparrow. A friend tells me that all last winter, a flock of one hundred or more roosted in a brush-pile on his place. Probably the explosion, under the brush-pile, of a half pound of No. 2 dynamite, costing twenty cents, would have killed the entire flock, or a net could have been sprung over them, and the entire lot taken alive. A singular accident to a flock of sparrows occurred in Tallmadge, in August, 1887, that may be worthy of permanent record. One afternoon, after a long, dry spell, there came up a heavy, electrical rain-storm, and about an inch of water fell in a few minutes. The next day, in a field belonging to D. E. Fenn, a well-known Summit county horticulturist, there was found in a pool of water, beneath a large hickory-tree, 160 dead English swallows. It is probable that they were killed by lightning, but some think the sudden drenching rain did the business, as the tree was not injured.

It may be expected of me, that I will, at this time, indicate some course of procedure, in investigating this matter of horticultural ornithology, and I gladly do it, as far as I can. It must be borne in mind that the division of birds into families, their general habits and habitats, times of migrating, places of nesting, etc., have already been pretty definitely established and published. No one can read Dr. Wheaton's work, in the fourth volume of the Geological Survey of Ohio, without realizing what an immense amount of work has already been done in this line. But in reading this, a horticulturist will become fully aware, also, that the subjects of food, and the economic value of the different birds, are scarcely touched upon. These particular points are just what most interest the members of this Society, and to them we should direct our attention. We should discover just as many facts as possible, and bring these facts together in their proper order, and be very careful to give each its proper weight.

Take, for example, the best known of all birds, the robin. We know, of this bird, that it is very gentle, and that it nests just where it will be handy to the fruit, and, further, that it commences laying very early, and, if nothing happens, its first brood will be rapacious cherry-eaters, by the first of July. We know, also, from sad experience, that from about the 20th of May, to the middle of August, the robin eats quite freely of cherries, raspberries and currants, and once in awhile eats a strawberry, or sticks his bill into a mellow summer pear or apple. We are also certain that he eats some earth-worms, for don't we see him on the lawn, after a rain, tugging away at something that seems to stretch out like the crack of doom, that it then suddenly gives away, and the robin almost falls over backward in the recoil? It hardly seems probable that a large, plump, fat robin, can build such a body on a diet of slimy earth-worms, for don't any school-boy know that a pint of earth-worms will turn to a handful of mud in a few days? So we have to ascertain what else the robin eats between the 1st of March and the 20th of May, and whether, during this period, he eats enough destructive insects to pay for the fruit he eats afterward. If we can only find out this, it is about all we need to know that is not already known about this bird. The facts that are lacking, can only be ascertained by close ob-

servation, followed up for a number of seasons, and the results of a number of observations must tally, before we can be certain that we have established a fact. I once planted a little patch of strawberries, on ground that was sod, broken up for potatoes the year before. One end of the patch didn't grow very well, and having considerable sorrel in it, the next spring I went to work and hoed it out, towards the close of April. I hoed up hundreds of May-beetles, or June-bugs, as they are differently called. The bugs were nearly ready to fly, and four robins, that had nests near by, at once proceeded to gormandize on the feast made ready to their bills. They hung around that little plat of ground for days, and I have always had a notion that the fat, plump body of the robin was built principally upon May-beetles. Still, I could not prove it by this one case, for it is only in rare instances that May-beetles get hoed up and left on top of the ground. The most of them crawl, at their leisure, out of the meadows and lawns, and if we can prove that they are the principal food of any bird, at such a time, then the usefulness of that bird is proven to that extent.

I am sorry, in presenting this report, that I am able to present so little of a practical nature in reference to protection, where birds are a source of serious loss. My narrow farm is bordered by a long strip of woods, and it ends in a large tract of woodland; and not less than a dozen species of birds prey upon my raspberries, and I know of no remedy. Raising berries in quantities, I do not see the loss as plainly as those who only have a row in the garden; and judging from the scare-crows I see in many gardens, I judge it is a close battle between the gardeners and the birds. In England, nets are used to protect fruit; but in this country it will not pay, and I see no way, in badly-infested places, but for those with small grounds to abandon the growing of cherries and raspberries, while those with larger grounds must plant an extra row for the birds. If this is not a satisfactory remedy, then we must take the other horn of the dilemma, and take our chances on the birds being less troublesome in some seasons than in others. If thorough study of the value of particular families or species of birds shall show their usefulness or the contrary, I doubt whether the means are at hand to destroy the mischievous, and protect the useful. The history of England, where for many years relentless war has been urged against the rooks and sparrows, with but meagre results, should caution us against being too sanguine. The deeper we study the matter, the more we will learn in reference to the far-reaching influences that determine the distribution and number of all kinds of animals and insects. Civilized man is a constant and powerful disturber of all the surface relations of the earth, and upon his operations are directly traceable many of the causes where there has been an unusual increase in a particular kind of bird, animal, or insect.

Men not yet fifty years old, well remember when the heavens were darkened for hours, in autumn, by the flocks of pigeons and black-birds, that passed in their migrations. Unbroken beech-forests existed at that time, in large tracts, the uncleared swamps were filled with black elder and black haw, and the huckleberries were not gathered twice a week, for the city markets. In the clearings, which were made in the higher oak and chestnut lands, were wide fence-rows, and whole fields entirely given up to wild berries and weeds. Small grain often remained in the fields, in shock, for four or five weeks, and thus, while the natural food of these two species was but slightly diminished, the pioneers' operations largely increased the supply of another kind. The result was, an enormous increase of birds, and I well remember when it was thought that the wild-pigeons and black-birds would capture the country. But more tidy methods among farmers diminished the food supply; constant clearing lessened the acreage of beech timber, and in some way rendered barren the trees that remained, and almost at once, both kinds disappeared so completely, that it is rare to see a flock of a single hundred of either. All that remains to remind us of this once numerous pest, is here and there a little swamp whose unwonted fertility reminds the old settler that there was a pigeon-roost, where, in the darkness of night, they hit the hapless pigeons with a stick, and carried them away in a two-bushel bag. It is in the same way that to-day, the horticulturist, by his operations, is enlarging the number of the fruit-eating birds. I could not help

but think of this, last year at Toledo, when Brother Harrison complained of the robin-nuisance around his home. He and his partners went into the open fields, and in a few years converted them into a forest of evergreens. They established numerous homes, with gardens and orchards. They established a paradise for robins, and orioles, and cat-birds. Every morning an army of workmen, and numerous visitors enliven the scene, and scare away all natural enemies of these birds, such as the cat, and hawk, and black-snake. The birds increase and multiply, and come back year after year, to do the same thing over. They invade the door-yard, perch upon the clothes-line on washing day, add their mite to the fertility of the lawn—not always discriminating between that and the flag-stone walk—and friend Harrison is disgusted, and vows destruction to the whole bird tribe. It seems to me, he is as fully responsible for the plague of robins, as he is for the great and wonderful nursery he has helped to build up.

But I must bring this long paper to a close; and in doing so, I must say that I have purposely avoided the appearance of sympathy with the birds, on account of their beauty, and sweet songs. It is said that a beautiful woman has a more than even chance against justice, in a trial by jury, and the same is true of some of our popular birds. My own sympathies are with the birds; and I trust the time is far distant, when the profitable growing of fruit will render it necessary, or indirectly lead to the destruction of our song-birds.

We do not miss them in winter; but a summer without their sweet melody, would be robbed of half its charms. If you doubt it, go to New Orleans in January or February, and there, arrayed in your summer raiment, beneath a summer sun, you will miss the birds, and realize that they fill a very large space in your conceptions of the delights of summer.

Leo Weltz said he considered the robin a greater pest than the sparrow, for he had seen the latter taking cabbage-worms, while the robin was of no account, except to pick up an angle-worm once in a while, when there was no fruit for him to work upon.

President: The next in order, is a paper by Mr. Farnsworth, on the exhibition of fruits.

THE EXHIBITION OF FRUITS.

BY W. W. FARNSWORTH, OF WATERVILLE, OHIO.

Although this subject is a much discussed one, the fact that our present system is not perfect by any means, may be considered a sufficient excuse for presenting it to the Society. It is a fact which cannot be denied, that many of our most intelligent and industrious horticulturists do not show the products of their skill at the various fruit-exhibits held throughout the country. The reasons for this are numerous; but I believe I am safe in saying, that the main reason is that they do not believe they can successfully compete with other exhibitors, who, though often times not as expert in growing the fruit, may be more skillful in exhibiting it. More than this, they sometimes refuse to enter the list for the same reason that many who consider themselves among our best citizens refuse to take any part whatever in the political affairs of the nation, lest they contaminate themselves thereby.

At least two leading objects should be kept in view in all displays of fruits, viz.: *Instruction* and *Entertainment*. The mere act of beholding a fine plate of Bartlett's on the exhibition tables, is in itself of but little value to us. We might nearly as well, look at the picture of it in the tree-agent's plate-book. But if, in addition to beholding that fruit, we are enabled to learn of the grower, just how it was produced, whether grown on

clay, sand, loam or gravel, high land or low land, drained or wet, sod, clean culture or mulch, young trees or old, tree dwarf or standard, sprayed or unsprayed, etc., then we can feel that we have not only delighted our eyes, but have gained some information that may aid us in our own orchards when we reach home. To be qualified to give reliable information in regard to a collection of fruit, the exhibitor must also be the grower. An exhibitor, who collects his specimens here and there, cannot get at the "true inwardness" of a variety, as can one who has planted, pruned, and cared for the tree from its infancy until fruition.

The exhibits of fruit should, in the main, be considered as object-lessons in Pomona's school. We also, by their aid, stimulate a friendly emulation and effort to excel. We believe that what man has done, man can do, and the existence of a very fine sample of fruit of any variety, seems proof positive to us that we can produce equally fine samples of the same variety; and if we succeed in doing this, we may be led to ask ourselves, why can't I grow the entire crop to this state of perfection.

It is a well-known fact, that it is much easier to cultivate than to construct; but I trust that what I may offer in this article, may be received more in the light of suggestions than criticisms.

It would seem appropriate that the arrangement of the portion of the State fair premium-list referring to fruit, be left to a committee appointed by the State Horticultural Society, and composed of members representing different portions of the State. And this brings before us the question of locality. Horticulturists are well aware that an equal competition among all portions of the State is impossible.

Take, for instance, collections of five, ten or twenty varieties of apples. The best collection for the southern portions of the State would be almost worthless for the northern portions, and vice versa; and it is impossible for a committee to render a decision which will be satisfactory under such circumstances.

We should also keep in view the fact that a certain quantity of fruit shown by a score of exhibitors, is of more profit to the fair, than an equal amount of fruit shown by three or four, or a half-dozen, because we have a greater number of interested parties.

We sometimes see worthless varieties included in the large collections, and it occurred to me that it might be advisable for our Society to prepare a list of standard varieties for our State, as is done in some other States. Why not offer premiums on fruit-dishes or baskets, containing the most beautiful arrangement of fruits of various kinds? Where the fruit-hall is sufficiently roomy, I believe it would add to the interest of the exhibit, to have an appointed hour or half-hour of each day, devoted to the discussion of the fruits on exhibition.

Perhaps the most perplexing and troublesome question which presents itself to the superintendent of a fruit-hall, is the selection of disinterested committees of ability and integrity. I had hoped that the expert system might solve this difficulty. But above all, I believe the great and crying evil to be, a lack of strict integrity on the part of many exhibitors. I do not wish to be understood as charging exhibitors with dishonesty; for although it may sometimes be carried to that extent, I believe the most of those whose practices are questionable, have drifted into them almost imperceptibly, by following the crowd. We see our competitors indulging in some breach of the spirit, if not the letter of the regulations, and we deem it no more than fair that we should compete with him upon an equal basis, so we take the same questionable advantage.

The horticultural portion of the fair should be so free from fraud, or even a suspicion of fraud, that we need have no hesitancy in inducting our sons and daughters into the innermost workings thereof, without any fear that they might find therein anything which could have a debasing effect, or tend to lessen their love or respect for the chosen avocation of their fathers, the production of Nature's choicest gifts of fruits and flowers.

President: We will omit the discussion on this paper, and will hear the lectures on Meteorology, by Professor Ragan.

A COLD WAVE ILLUSTRATED.

BY W. H. RAGAN, OF INDIANA.

Being called upon, W. H. Ragan, of Indiana, delivered the following lecture on Meteorology, taking the "blizzard" of January 10, 1886, as a basis of his remarks, and using the tri-daily signal service charts for the purpose of illustrating his views on the subject of the movement of cold waves. This interesting lecture was delivered *extempore*, and therefore can only be presented to the reader in synopsis, and must, of necessity, lose much of its interest through the absence of the charts, by means of which the movements of this noted storm were so well illustrated :

The effects of climate on organic and inorganic matter, is fully recognized, especially by the Horticulturist, for who is more concerned than he? The natural causes that produce the most violent climatic changes, and therefore, have the greatest effect upon animate and inanimate matter, are not well understood. If our continent were a level, unbroken plain, from the tropics to the arctic regions, a given parallel of latitude would more nearly represent the character of climate belonging thereto. As it is, when we trace the isotherms, or lines of mean temperature, across our continent, we find them very eccentric in their courses, apparently having but little respect for latitude. This fact is most forcibly illustrated by the movements of such storms as we now have under consideration, and for the designation of which a seemingly appropriate word, blizzard, has been coined, and awaits adoption in the next edition of Webster.

The atmospheric conditions that precede a blizzard—indeed, constitute the preliminary features of it—are a low barometer, centered well south, and moving northeasterly. As a rule, we have from eight to fifteen low-pressure movements during a month. Almost without exception, these pass out of the territory of the United States through the lower St. Lawrence valley. Just why this is so, need not now be considered. Usually, these centres of low pressure arise in the Rocky Mountain regions of the United States, or enter our territory from Manitoba, and, passing through or near the great lakes, follow the St. Lawrence to the northeast. Conditions of this kind may bring us, in the central Mississippi valley, thunder-storms, heavy rains or snow, wind, and even tornadoes; but will not give us a genuine blizzard, in all its fury, with a resultant temperature of from 15° to 30° below zero. If, however, an area of low barometer enters the territory of the United States from the Gulf of Mexico and passes northeasterly toward the mouth of the St. Lawrence, and if this be during the winter months, we may have a severe cold wave, extending far into the south, and borne to us in the latitude of Indiana and Ohio, by winds from the west, or even from the southwest.

In some particulars, the storm under consideration has excelled any on record. This is especially true in regard to its extent and unusual severity in the extreme south. When we refer to the records of the Signal Service, we ascertain the causes of this unusual distribution. As stated above, certain barometric conditions are the prelude to such storms. In this case, (and this is but the type of all such storms), a low barometer of unusual energy came within the range of observation near Las Animas, Col., at 3 o'clock P. M., Washington time, on January 6th, 1886, from which point it moved southward into the Gulf of Mexico, where it was central at 3 o'clock P. M., of the 7th; from here it was deflected to the left, being noted eight hours later over the mouth of the Mississippi river, and thence it passed northeasterly, following the Gulf and the Atlantic coasts, reaching the mouth of the St. Lawrence at 7 A. M. of the 10th.

An area of low barometer may be illustrated by, if not compared to, a vigorous blaze as a burning building, which creates a rarified condition of the atmosphere, and a conse-

quent rush of surrounding air to fill the void. In the northwestern portion of our continent, in the elevated regions of the Rocky Mountain chain, we have a comparatively constant high barometer. When a low starts up, a corresponding high, from this region of constant high, flows in to fill the vacuum.

Farther north, in the arctic region, may be found, as a constant or passive element, a low temperature. Without a disturbing cause, this condition of low temperature will hover about its proper latitude. When, however, a low barometer, which is always accompanied by high temperature, arises, a high barometer moves into its wake, thus producing currents of cold air from the arctic region, with a resultant lower temperature. If this low barometer passes through the central or northern portions of the United States, it is easy to understand why it should not draw a volume of cold air into the southern portion of the country. But when the reverse is the case, as was true of the storm under consideration, and especially if the low has unusual energy and force, we may certainly expect the whole country to be overspread with a sheet of cold.

There are natural causes which direct and control the movements of such storms, when once inaugurated. If not, their movements would be direct, and they would sweep down upon us of the central Mississippi valley from the north, rather than from the west or southwest. Hudson Bay and the lakes, to the north of us, with their stored summer heat, ward off these storms, pushing them, as it were, to the westward, and against the Rockies, where they follow in the lee of the mountains, which turn upward and beyond the reach of interference, the warm currents from the Pacific, and, facilitated in their movements by the great, treeless plains, they reach the track of the preceding low barometer. As the low almost invariably moves to the northeast, the high, with its cold, naturally follows. Thus, we have the phenomenon of cold weather coming to us from the west or southwest.

I will now hurriedly illustrate, by the use of a set of tri-daily Signal Service charts, the movements of the storm under consideration. As already stated, you will notice the ink-spot on the chart in eastern Colorado, which marks the center of the low barometer, at 3 P. M., of January 6. The dark, wavy line across the upper portion of the chart, indicates the line of zero temperature at that hour. The almost unchanged position of the zero line, in the lake region, during the prevalence of this storm, will illustrate the beneficial influence they (the lakes) exert upon the climate, a fact which gives to Michigan and the surrounding territory, its just renown as a superior fruit-growing section.

Turning to our next chart, which represents a period eight hours later, we find that the centre of the low area, is now near Fort Sill, in the Indian Territory, and that the zero line has dropped down, from Fort Custer to Denver, while all the Gulf region is basking in a temperature much above the frost point.

The next chart, which is for 7 A. M., of the 7th, represents, as you will see, the centre of the low barometer as being near Indianola, Texas, and the zero line at Santa Fe and Fort Elliott, but almost unchanged as to the Lake region. The temperature of the Gulf coast, at this observation, is 40° and upward.

This chart, which is for 3 P. M., shows the centre of the low, to be in the Gulf of Mexico, immediately south of Indianola, and off the mouth of the Rio Grande. The zero line has also dropped down, and that, too, against the tempering influence of the afternoon sun, from Fort Elliott to Fort Sill, while the temperature of the Gulf coast, responding to the combined influence of the sun, and the presence of the lower barometer, which you have already learned invariably brings higher temperature, has arisen to 60° and even 70°. The orange orchardists of Florida are yet unconscious, unless warned through the signal service, of their impending doom.

At 11 P. M. of the 7th, we find the low barometric area covering the mouth of the Mississippi, and that the zero line has spread eastward to Fort Smith, Arkansas, from which point it extends almost due northward to St. Paul and the St. Louis river, where it turns eastward through Lake Superior into Ontario. The temperature has fallen in Texas to 30°, at Indianola and Galveston, but is still 60° in Florida.

The chart for the morning of the 8th, presents the low centre at Montgomery, Alabama, and the zero line extending from the Rio Grande, below El Paso, Texas, by way of Palestine, Little Rock, Keokuk and Lake Superior. Temperature of Florida from 50° to 70°, while all of Texas is below 20°.

Eight hours later (the heat of the day) the low, is in eastern Georgia, while zero has extended eastward to the Mississippi river, but is receding in western Texas. The orange orchards are still unharmed in Florida, but they are suffering in Louisiana. At 11 P. M. the low has reached the mouth of Chesapeake bay, and the zero line now takes in Memphis and northern Mississippi. The Gulf coast from Pensacola westward has a temperature of 20° and lower, but east and south Florida are above 50°.

The morning chart of the ninth, shows the low area on the New Jersey coast, and zero extending from Santa Fe via Denison, Vicksburg, Chattanooga, and thence northward to Cincinnati, Chicago and Lake Superior. Jacksonville and Cedar Keys have a temperature of 30°, while Sanford and Punta Rassa have 40° and 50°, respectively. At this observation we note the greatest barometrical gradient that occurred during the storm, the readings being, at the centre of the low, in New Jersey, 28.8 inches, while on the northern border of Minnesota it was 30.8 inches. The disparity of readings were unusual, which gave the storm its peculiar force.

The 3 P. M. chart shows the low on the coast of New Hampshire, with the zero line comparatively unchanged. The night observation of the 9th shows the low area in central Maine with zero extending still more to the eastward. The temperature is rising rapidly in Texas and the southwest, but still falling in Florida, having now reached 30° in the central part of the peninsula.

Our next chart represents the storm at its maximum. This is the morning of the 10th. The low barometer has now reached the mouth of the St. Lawrence, and the zero line extends from Utah, through New Mexico, Texas, Arkansas, Mississippi, Alabama, Georgia, North Carolina, and Virginia, and the line of 30° crosses Florida as far south as Punta Rassa.

The disastrous results of this storm, in the extreme south especially, are fresh in your memories. It is said that no such cold has occurred in Florida, as demonstrated by its effect on tender vegetation, since 1835, when they unquestionably had similar atmospheric conditions as the predisposing cause.

But the unusual character of this storm was manifested solely by its severity in the south. It has frequently been colder in Minnesota, or even in Indiana and Ohio, in the last half-century, than on this occasion. Indeed, only two weeks later, we were warned to "hoist cold-wave flag," and notified that at St. Paul they were having several degrees lower temperature than they had during the previous storm, but we did not realize its increased severity, while in Florida they were scarcely disturbed, the change from normal temperature being hardly noticeable. On consulting the charts for this second storm, we discovered that the low barometer, the disturbing cause, had originated very near the location of the preceding storm, viz., in Colorado, but, instead of the unusual route taken by the first, had followed the normal course, in an almost direct route toward the Gulf of St. Lawrence, and hence the high barometer and cold wave were only invited as far south as the line of the preceding low area.

N. Ohmer: It is growing late, yet I feel like saying a few words. I have often wondered why the weather was often so much colder South than it was where I live.

Last year the American Agricultural Society held its Eighth Annual Meeting in California, and I happened to be one of the hundred that went. When we left Kansas City, at one o'clock on the afternoon of the 12th of January, it was snowing, but not very cold. When we went down South, further, it was a little colder than it had been North.

We were going South at a rapid rate, and it was still getting colder. That night seemed the coldest I had ever experienced. It was so cold that we could not stay in bed, and we actually had to cry with the cold. Our train could not go. We were ten days getting there, checked by the snow, and when we got to California, it was pleasant weather.

Mr. Albaugh: There were a dozen of us at the hotel, and we had a big fire. Although it was in the middle of November, we actually had to go to our meals with our overcoats on, all the time.

Mr. Longenecker: I think they must have been struck by one of the blizzards we have heard of down there.

On motion of Mr. Cushman, the meeting was adjourned until to-morrow-morning, at 9 o'clock.

FRIDAY MORNING, *December 14, 1888.*

The meeting was called to order at 9 o'clock, by President H. G. Tryon. He announced that if there was any unfinished business, the Society would now take it up.

Mr. Trowbridge: I was not present when the election took place yesterday, and I am informed that I was elected Treasurer. With all due respect to that committee, and with proper regard for the Society, I feel it incumbent on me to positively decline the office.

President: We are sorry to hear Mr. Trowbridge decline; still, we do not feel, that we should force any office upon our members against their inclinations. What action will the Society take?

Mr. Cushman: I was on the committee. In our deliberations, we tried, as much as possible, to get officers of this Society from all over the State. We have nominated our President from the northern part of the State, the Secretary from the north-west; it would be right to have the southern part of the State represented, and Mr. Trowbridge was chosen as a worthy representative of that section. I am sorry if he feels that he cannot accept the office.

Mr. Trowbridge stated that, for reasons personal to himself, he could not consent to accept the office.

President: A motion is made and seconded, that Mr. Trowbridge's resignation be accepted. The constitution provides that his successor shall be elected by ballot, after a nomination is made.

The resignation of Mr. Trowbridge was duly accepted by vote of the Society.

Wm. S. Crawford: I would nominate Mr. N. H. Albaugh, of this county, for our Treasurer. We all know he is well fitted to fill the office, and he has a bank for the safe-keeping of the money.

President: The question will now be upon the election of Mr. Albaugh, if there are no other nominations.

Mr. Cushman: I move that Mr. Campbell, the Secretary, be authorized to cast the ballot for the Society for the election of Mr. H. N. Albaugh, for Treasurer of the Ohio State Horticultural Society.

The motion was carried by unanimous vote. Secretary Campbell cast the ballot, and Mr. H. N. Albaugh was declared duly elected Treasurer of the Ohio State Horticultural Society.

Mr. Cushman: If there is no other business, I suggest that we take up the discussion of small fruits.

T. F. Longenecker: I think there is another matter of interest to the Society. I move the adoption of the following resolution, that it be made the duty of the Ad Interim Committee, in addition to making reports, to solicit memberships for the Society:

Resolved, That in addition to the regular duties of the members of the Ad Interim Committee, it shall be their special duty to solicit members for the State Horticultural Society.

President: You hear the motion; that it be made the duty of the Ad Interim Committee, during the year, to solicit memberships for the State Society.

Leo Weltz: Should it not be the duty of every member to solicit as many additional members as possible to this Society? Would it not be right for every one of us to consider himself as one of the committee, to bring in members. I think I have done my duty, so far as I am personally concerned, and therefore, if you allow me to make an amendment, I move that it be made the duty of every member to solicit new members to the Society.

President: Has Mr. Weltz's motion a second? You hear the amendment, which is, to include all members of the Society. Any remarks?

Mr. Longenecker: The reason why I put it in this way is because, if every member of the Society is considered an individual member of this committee, you will find that no one feels it his special duty to do anything; but if you appoint one individual, or a certain number, they will do more than in any other way.

Mr. Farnsworth: I think Mr. Longenecker takes the right view. To let the responsibility rest upon a few, is the only way to get any good work out of it. I feel that if you appoint the whole Society, they will feel no more responsibility than at present. Of course, I would not have it understood that this will be likely to prevent members of the Society from bringing in others, also.

President: The question is upon the amendment, which was made and seconded, that we include all the members of the Society in Mr. Longenecker's resolution. Those in favor of the adoption of the amendment, may manifest it by saying aye; contrary, no. The motion was lost. The question now is upon the adoption of the original resolution. Now, it strikes me as more important than the resolution itself, that appointments be made, for the Ad Interim Committee to visit neighboring county societies, and there solicit memberships to the State Society. I do not suppose there are one-fifth of the county societies represented at this meeting. If there are no further amendments, the question is on the original resolution. Those in favor of the adoption of the resolution, say aye.

The motion carried, and the resolution was declared adopted.

President: There is one other question. In speaking with Secretary Ragan, this morning, he stated the fact that for years he had been Secretary of the American Horticultural Society, and received no compensation whatever, except from what was left over, from the sale of the reports. The reports are printed from the membership fees, and sent out. If there is anything left over, he gets it, but in some seasons, he has taken out of his own pocket, to get them distributed. This State organization expects to come up to the general scale, and ask that the expenses of our Secretary be paid, and our Ad Interim Committee be paid. We are at work for the people.

I never come to these meetings but what I feel an inspiration to do better work, myself, and I feel wonderfully repaid for the benefit it is to me. It is paid for ten times over, in its beneficial influences in our neighborhood, without taking any credit to myself. Now, I feel it proper that the State of Ohio should be drawn upon, for the benefits that the State Horticultural Society render to it. I will make this suggestion: The Commissioner of Agriculture has appointed Mr. VanDeman, as Pomologist, to whom they pay a salary. Now, I think if they have the authority to pay Mr. VanDeman, they have authority to pay the Secretary of the American Horticultural Society. For ourselves, I think we are certain this year, of getting our annual appropriation. The reason we did not get it last year was, that we had been saving up money, and at the time the Auditor of State made his report we had on hand about \$1,000. However, we might help the Farmers' Institutes, this year, out of the funds of the Society, with the prospect of getting that money.

Secretary Campbell: I think it will be better not to take any action, until we have the appropriation. I think Mr. Bonham does not expect anything of the Society in its present financial condition. I would be very glad to do it, but I think we should not appropriate money when

we have not got it. We appropriated nearly all our surplus funds to assist the Centennial Exposition.

President: By the way, Mr. Longenecker wrote to Mr. Bonham, that he would volunteer two weeks' work in the institutes. I do not know but that made me feel under a little obligation; so I volunteered, also.

Mr. Longenecker: If we are through with this matter, would it not be well that we should take up the question of small fruits.

President: We have a number of subjects here, that were not discussed. We will take up Raspberries. If any one has anything to offer upon Raspberries, or any question to ask, we would be pleased to hear them.

Mr. Cushman: I would ask this question: Who knows a better Raspberry than the Gregg?

Mr. Pierce, of Summit county: There are two objections to the Gregg, in Summit county. One is, that its price is quite low; only \$2 a bushel; and the other is, it winter-kills, and does not give a crop every year.

Mr. Palmer: The Gregg has been fruited all over Ohio. I know of no better black-cap raspberry, where it succeeds well; but it needs the soil adapted to it, good, sandy soil. The Gregg is an excellent berry, but it lacks in hardiness. What we want, and it is coming, is a berry as good as the Gregg, in every respect, and a little more hardy. The Gregg will endure about 10 degrees below zero. This year I fruited a great many seedling Greggs, and I thought I had just what I wanted—a very large, fine berry; but when I come to pull it, it was so dry and seedy, I could not eat it; it was worthless. With us, the Gregg does very well, except when we have a very cold winter.

J. Cunningham: I will say we have a berry which we think better than the Gregg, and I have tested the Gregg very thoroughly. The Ada raspberry I have known from the time it first fruited. It is better on low, clay land than it is on high, gravelly land. It is equal to the Gregg in quality, in its habits of growth, more productive, and perfectly hardy. I have never known it to be killed on low or high ground in winter. In this, it excels the Gregg.

L. B. Pierce: What degree of cold has it endured, up in your locality?

Mr. Cunningham: I cannot tell exactly, but I know it is very hardy. It has stood the coldest weather we have had.

Mr. Farnsworth: Let me say, right here, that while a great many are complaining of the Gregg, we have a plantation that has been out six years, and they have stood very well; so I think we cannot measure the degree of injury to the plant by the thermometer.

I also wish to speak of one thing that was brought to my mind last night, by Professor Lazenby's remarks, with regard to the relative proportion of seed in the Turner and Ohio. The Turner is adapted to much thinner soil than the Ohio. I have a small patch of them on clay ground, and they are utterly worthless; while some of my neighbors, on low, sandy soil, succeeded well with them. On this same soil, my Gregg succeeded finely. With regard to the Hilborn, I am very well pleased with it; it is of excellent quality. I think it is between Ohio and Gregg in size, and I think if I were confined to one raspberry, I would prefer the Hilborn. It ripens between Souhegan and Gregg.

Mr. Longenecker: While raspberries do not do equally well in every situation, I have observed that varieties that have a distinct bloom on the stems are generally both healthy and hardy. I believe for the best situation, I would select ground that slopes to the north-west. Then, if the soil is adapted to the variety, you will find the best success.

F. R. Palmer: I can report very favorably on the Hilborn; it is a good berry, every way.

President Tryon: I have observed that if we have warm, damp weather in October, raspberry plants keep green and retain their leaves, and the wood is tender and more likely to be winter-killed. If the weather is cool, and the leaves fall, the wood is ripened better and hardier.

Geo. W. Trowbridge had observed that in his experience, a moderate growth of raspberry canes gave more and better fruit; large and overgrown canes were often unproductive.

Timothy Munger inquires if any one has experience with Johnson's Sweet raspberry.

W. J. Green was understood to say, it was good in quality, but subject to mildew, and liable to be winter-killed.

N. H. Albaugh: In our market raspberries have not been very profitable. Prices have been too low. I raise the Ada; for family use, I think it has no fault, but I regard Hilborn as the most promising market variety at this time.

T. F. Longenecker: I would inquire as to the Earhart Ever-bearing raspberry?

Mr. Green: I have not much use for the Earhart. It has little, if anything, to recommend it. Not hardy.

J. W. Simmons: I have fruited the Hilborn and find it good; it roots well, and is very satisfactory in making plants from the tips. Hardy in winter. I have grown the Earhart, but have not one living now, and I cannot speak favorably of it.

F. R. Palmer: I have fruited the Hilborn three or four years, and it is the best medium berry, ripening between the early and late varieties.

It is the best black-cap I know of for our locality, at its time of ripening. Better in quality than the Souhegan, and the canes are strong and vigorous. Ten years ago, I had more orders for late than early berries; now early ones seem most in favor. The Souhegan is perfectly hardy. Shaffer's Colossal is growing in favor.

Leo Weltz, of Clinton county, offered the following:

PREAMBLE: In view of Congress having raised the position of Commissioner of Agriculture to that of a Cabinet Office; and in view that this most important office may be occupied by a man from the ranks of Horticulture and Agriculture; therefore,

Resolved, That the Horticultural Society of the State of Ohio, in convention assembled, earnestly urge that the above qualifications be taken into consideration in making the appointment to said office.

Mr. Ragan: I do not understand that the bill has passed Congress. It is, however, strongly believed that it will. It is in the hands of the committee, and it will doubtless be passed in some shape. We can make a recommendation to that effect.

N. H. Albaugh moved the adoption of the resolution, which received a second, and after a few remarks in approval by President Tryon and Geo. W. Trowbridge, the motion was carried, and the resolution was declared adopted.

President Tryon: The next thing in order is the Strawberry.

B. F. Albaugh: Our Miami Valley Horticultural Society, through one of its esteemed members, Mr. J. D. Kruschke, has introduced a strawberry that is of especial value, and is deserving of special notice. It is named the Miami, is exceedingly fruitful, is of good size and flavor, and is somewhat later than the ordinary varieties, and so comes into market at an opportune time. It has been perfectly tried, not for one or two seasons only, but for a half-dozen years, and has "come to stay."

Mr. Longenecker: It could hardly, I think, be a seedling of the Big Bob, judging from its appearance on the grounds of the originator. One objection I have to the Miami is, that the leaves curl up at the point; but as regards productiveness, it appears to be very good.

In reply to a question, Mr. J. D. Kruschke, the originator and introducer of the Miami, said it was believed to be a seedling from the Big Bob; but that should not be regarded as anything against the Miami, which really had no characteristics of the Big Bob, and which should be judged upon its own merits, as it had now fruited and been tested for seven years. Reports from other sections had not all been favorable—but in Miami county it had been found of remarkable excellence, and was thought to be very promising for value and profit. It is a late ripening berry.

President Tryon: Anything further on this subject of strawberries?

T. Munger: I would ask how Jessie is succeeding? With me, I do not think it is going to be as productive as was reported.

Mr. Palmer: I would like to know who can tell us of the Haverland?

Geo. W. Trowbridge: The Haverland originated a few miles from my home, by Mr. Cary, a very enthusiastic fruit-grower. I was called to see the first fruit it bore. It is a pure, pistillate berry, and will rank in quality about with the Crescent. The foliage is of the best. It requires a fertilizer, and would recommend Wilson, or May King for that purpose. It is claimed that the Haverland, under favorable conditions, would produce 1,000 bushels on an acre.

B. F. Albaugh said the Haverland should have two fertilizing varieties—an early and a late one. He likes the Haverland.

Mr. Longenecker: I have had the Haverland a couple of years; it is a good bearer, of good size, but only moderate in quality. It is necessary to be very careful to get it fertilized. May King will probably be a good fertilizer.

J. W. Simmons: I have grown a number of varieties, and I think Jessie and Bubach are the best. The Jessie has done well with me, and is very promising.

W. S. Crawford: Jessie has been a success, and my father has much confidence in it. He thinks the Bubach first, and Jessie the second in value.

Messrs. Trowbridge, Cushman, and Palmer all give preference to the Bubach—but Mr. Trowbridge thinks Jessie the most vigorous grower.

Member: Now, I have the Bubach and Jessie, and Bubach is the best. My soil is a sandy, clayey loam.

President Tryon: The Bubach seems to be ahead. Any further remarks on Strawberries?

W. J. Green: The Miami has done nicely with us for the past two years, and we think very well of it. It may not do as well on all soils; and with us it is not equal to either Bubach or Jessie. It is a late berry; but not later than the Ohio. It is more productive, rather better in quality, and of better color than the Cumberland. The Haverland is very pistillate, and should have a fertilizer every other row.

F. R. Palmer: For best results with all pistillate varieties, we should plant fertilizers in every other row.

W. H. Ragan: Mr. President, I wish to say that I regret very much that I am obliged to leave you; but I wish to say, that I have enjoyed myself very much at your meeting, and have made many pleasant acquaintances.

President Tryon: I know I am speaking the sentiments of the

Society when I say that in their behalf, I extend our most sincere thanks to Professor Ragan, and that our best wishes will be with him.

Geo. W. Trowbridge: I wish to offer a resolution, thanking the Miami County Horticultural Society for their thoughtful attention in providing such a delightful hall, and everything so comfortable and convenient for our meetings. On motion, resolution was adopted unanimously.

President: The next in order is the Gooseberry. Who has tried the Industry?

Mr. Cushman: I do not know what better berry we could ask for. It does fairly with us, so far; but fear foliage may not be quite perfect.

B. F. Albaugh: With me, Industry has been rather a feeble grower, and the fruit is covered with spines.

Mr. Simmons says his Industry gooseberries have no spines.

T. Munger exhibited samples of a new gooseberry, grown by Mr. Stine, of Piqua, somewhat larger than Downing, and claimed to be free from mildew. He would ask the Society about Smith's Improved? Is it valuable for general market? My impression is, that it is the coming berry.

Mr. Green: It is as large and fine as the Downing, and it is an improvement upon the old Houghton. The bushes are rather dwarfed.

Mr. Farnsworth: I would like to ask Professor Green which gooseberry he considers the most profitable for market?

Professor Green: I like the Downing best. The spines on the Industry are more like hairs; entirely unlike the hard, thorny spines of old, native varieties.

Mr. Cushman said he thought all gooseberries should be left to ripen on the bushes, before marketing. He advised to grow only the larger varieties.

President Tryon: The next thing in order, on the programme, is the Currant.

B. F. Albaugh inquires who has experience with the Crandall currant. He finds it a good grower, and had but little of the odor of the ordinary black currant.

L. B. Pierce said the color was purplish-black. He thought it more productive than the common black currant; but that the market demand for it would be limited.

Mr. Munger inquires about Fay's Prolific. He prefers the Versailles or Cherry to the Fay. He had found it subject to injury by the pith-borer. He exhibited a can of Cherry and one of Fay, which were about the same size.

E. H. Cushman had seen the Fay in Cleveland market, and they were no better than the Versailles.

B. F. Albaugh inquired if there was any difference between the Cherry and Versailles currants. General opinion is, that there is little, if any difference.

President: There was a question asked in reference to the Victoria currant. I think the Secretary could give us some light on that subject.

Mr. Farnsworth: I would say, in regard to the Victoria, with me, it is very much superior to the Fay. The Fay is a very weak grower. I consider the Victoria the most profitable currant I grow. Another thing that I have discovered is, that currants require, perhaps, the lightest soil of any fruit grown.

Mr. Simmons said he had found the Fay currant a good grower.

Member: I would like to inquire whether any of the members have had any experience with the White Grape currant.

T. Munger: I do not think the White Grape currant will be productive enough for us to be profitable.

Mr. Cushman: It just occurred to me, that wherever I have seen that currant fruiting most successfully, it has been in sandy loam.

Mr. Pierce, of Tallmadge: Seventeen or eighteen years ago, I tried the White Grape currant, and never got any profit from it.

Mr. Farnsworth said he thought the White Gondouin was better.

Mr. Albaugh: The Victoria, with me, is very promising. The growth is healthy, and foliage good. The Warder I have fruited for two years, and, with me, it promises to be one of the best varieties. I think it will be quite productive. I have fruited the Cherry, Warder and Victoria, for a number of years. I would say that I can produce the Victoria as large as those Fays. My soil is not a sandy, but a clay loam.

J. W. B. Youtsey said he had found the White Grape and Victoria currants the best of all currants on a clay loam. The currant-worm, he thought, was decreasing.

T. Munger also reported a decrease in the ravages of the currant-worm, caused, as he thinks, by the use of white hellebore. He uses dry hellebore, one part to eight parts middlings, dusted upon the bushes. He reported an insect which he had found eating the larva of the currant-worm.

President Tryon said the currant-worm had appeared to be worse upon the Red Dutch currant than any other.

Mr. Cushman: We are considerably interested in plum-culture, at Euclid, and it is desirable for us to know whether the Niagara is any earlier than the Bradshaw plum. If it is not, it is so much like the Bradshaw it has no particular value over it.

L. B. Pierce said Mr. Woodward, of New York, reported that the Niagara and Bradshaw were very similar.

F. R. Palmer said he had Bradshaw and Lombard. The Bradshaw rotted badly, while the Lombard did not.

President: Anything further on the currant? The next on the programme, is the subject that was mentioned this morning: What is the best method of treating the raspberry-field, during summer and autumn, after fruiting?

J. W. Simmons: Our plan of treating the raspberry-field is to cultivate constantly with shovel-plow and Planet, Jr., cultivator, until August, when it is time to layer the tips. We do not mulch. We cultivate shallow, and not very close to the rows, which are planted six feet by two. The plants stand up, and brace against the wind better than if they were further apart. We leave only three or four canes in a hill; had rather have two strong canes, than half a dozen weak ones. We leave laterals eighteen inches long.

F. R. Palmer: We cut back laterals on our raspberries to ten inches. We get less berries in number, but enough larger to be of more value.

L. B. Pierce inquires how to keep the rows clean.

Mr. Simmons: Use the hoe.

F. R. Palmer plants his raspberries three by six feet. Greggs are usually good for three crops; Doolittle, Ohio, and others, from six to seven crops. It is not well to leave the field too long without renewal.

Mr. Pierce said he found the Gregg easier to keep clean than most varieties, on account of its more upright habit of growth.

Mr. Simmons said the Gregg does not succeed with him as well as formerly, on account of injury by the snowy tree-cricket.

W. J. Green asks if the red raspberries should be pinched back, the same as the black-caps. The remedy for the snowy tree-cricket is to cut off and burn the affected canes, at the spring pruning.

B. F. Albaugh does not pinch back red raspberries. Plants Turner and Cuthbert in rows eight feet apart.

President Tryon commences to cultivate his raspberry-field as early as possible in spring; tills thoroughly until fruiting time, and not after. Leaves the old canes until spring. Pinches back Cuthbert, at three feet in height. Never prunes a raspberry-cane after it begins to ripen.

T. Munger inquires about the Marlboro'.

President Tryon and Mr. Palmer both replied: It was not prolific enough.

F. R. Palmer said he put a leather apron upon the breast of his horse when cultivating among raspberries late in the season.

H. Cushman recommended the horse-hoe, which they used in the cul-

tivation of their vineyards, as a valuable labor-saving and effective implement. Does not trim the Cuthbert raspberry.

W. W. Farnsworth would not trim the Cuthbert in summer, but thins and cuts back severely in spring.

E. H. Cushman described his horse-hoe, and was asked to supply a drawing of it to the Secretary for illustration in report.

President Tryon said he had found the Planet, Jr., the best cultivator he had used for small work. The Acme harrow he recommended as also very useful in cultivating vineyards.

B. F. Albaugh, in reply to an inquiry, recommended the planting of the Napoleon Bigarreau cherry.

L. B. Pierce said there was an objection to it, in his section. It was very liable to rot when just beginning to ripen.

A motion was then made to adjourn, to meet again at the call of the Secretary, which was carried.

REPORT OF THE COLUMBUS HORTICULTURAL SOCIETY.

BY W. S. DEVOL, SECRETARY.

The annual meeting, on the first of December, closed another annual volume of our little Society's proceedings. With a membership of less than one hundred, we still maintain an existence, and hold regular monthly meetings; hear read profound papers, receive excellent reports on fruits, botany, entomology, etc., and engage in animated and instructive discussions.

Since our report to the State Society, submitted a year ago, we have held thirteen meetings. Most of these meetings have been held at our rooms in the City Hall, of Columbus, but several occurred at Horticultural Hall, State University, and at the homes of some of the members.

Three of the meetings varied from the usual routine. These were the Arbor Day, the Strawberry, and the joint meeting with the State Society. At the first named, the Society joined with the students of the State University in the observance of Arbor Day, by the planting of trees and engaging in literary exercises. At the meeting with the State Society, in September, a majority of the papers announced and presented were prepared by members of the Columbus Society.

Our membership has been slightly increased during the year, and some of the acquisitions are proving themselves valuable members.

At each meeting, we have one or more regularly prepared papers, most of which are very interesting and instructive. Not less valuable are the reports of the standing committees. The reports on fruits and entomology are especially interesting, embodying as they do, the results of observations at the Ohio Agricultural Experiment Station, and at the experiment gardens of our Society, on Mr. O. W. Aldrich's place.

The Society has undertaken the collection and publication of a brief history of Ohio Horticulture. Considerable material has already been obtained, and is being published in our journal. This is a matter that should interest every intelligent horticulturist. Much of this valuable material, comprising the facts of the beginnings and

development of horticulture in our State, will, if effort is not made to collect and preserve it, soon be lost beyond recovery.

Within the last month, there died the last son of one of the first, if not the very first, in point of time, of Ohio's nurserymen. He has taken away much concerning the early horticulture of our State, which we ought to have had in some permanent record. So, all over the State, the pioneers of horticulture, in their respective localities, are just as rapidly becoming men of by-gone days. It is desirable to know the antecedents of every variety of fruit, and of every branch of horticulture. How can we better learn them, than by collecting and publishing, as far as possible, all the known facts? We ask the State Society, and each of its members, to render such assistance as they can, by collecting and forwarding to the Secretary of the Columbus Society such facts as they may know, or can learn, concerning the early history of horticultural societies, horticulturists, nurserymen, nurseries, gardeners, green-houses, and varieties of fruits, flowers and vegetables.

The officers of our Society, for 1889, are as follows:

President, O. W. Aldrich; Vice-President, W. R. Lazenby; Secretary, W. S. Devol; Treasurer, Geo. W. Sinks.

Executive Committee—W. J. Green, Mrs. N. E. Lovejoy, Clarence M. Weed.

Standing Committees—Botany, A. D. Selby; Entomology, Clarence M. Weed; Meteorology, M. Craig; Library, J. J. Janney; Fruits, W. J. Green; Plants and Flowers, Mrs. N. E. Lovejoy; Vegetables, R. J. Tussing.

PORTAGE COUNTY HORTICULTURAL SOCIETY.

BY ANDREW WILLSON, SECRETARY.

Early in the year, this Society sustained a great loss in the death of its worthy and lamented President, H. J. Beebe. This sad event occurred January 29th, taking from the Society one who had been its President from its organization, and who had labored with hand and brain, for its prosperity. But while deploring the great loss, the Society felt that it could best honor the memory of the departed, by doing all possible to advance the cause in which he has been so earnestly interested.

Geo. W. Dean was unanimously elected President, and under his administration, prosperity has still smiled upon the Society. It has 83 paid members, and a total membership, including wives and unmarried children, of about two hundred and fifty. Meetings have been held regularly every month, and the attendance has averaged from 45 to over 200 persons. A truly commendable degree of interest has been manifested. The Society is determined to fully maintain its high standard, both socially and intellectually, and to become as great a power for good as possible.

LAKE COUNTY HORTICULTURAL SOCIETY.

BY H. B. DRAKE, SECRETARY.

PAINESVILLE, O., December 14, 1888.

Secretary Ohio State Horticultural Society:

The Lake County Horticultural Society was organized in March, 1881, with the Hon. H. G. Tryon as President, and S. F. Whitney, Secretary. The number of members en-

rolled for the year, was twenty-eight. The average number of members for eight years, is thirty-six, and the present number is thirty-five.

The Society held a strawberry show in June, at which premiums were given, amounting to five dollars, which brought out a small display of very fine fruit. There was also a grape show held in September, at which premiums were given, amounting to ten dollars, and it was said by persons, who had attended many of the State and county fairs, that the fruit was as fine as any they had ever seen, although the display was not large.

A number of papers were read before the Society during the year, some of which were: "How to plant and care for the orchard," "Home adornments and surroundings," "Some reasons why we should raise more good, and less poor fruit," and "Insects injurious to fruit."

Usually, after a paper is read, there is a discussion of the subject contained in the paper. There have been other subjects discussed; such as "Pruning," "Saving and applying manure," "Putting up fruit for the market." The Society contemplates holding a fruit show the coming year.

SUMMIT COUNTY HORTICULTURAL SOCIETY.

BY M. CRAWFORD, SECRETARY.

The Summit County Horticultural Society was never in a more prosperous condition than at the present time. Harmony and good will prevail among all its members. We meet every month, expecting to have a pleasant and profitable time, and we are never disappointed. Our meetings are held with members in various parts of the county, and as each one desires to have a good crowd, he invites his neighbors and friends, and in this way a large number of outsiders become interested. Our members bring the best specimens of their horticultural products for exhibition, and the hour or two before dinner is spent in examining these things, discussing their merits and the methods used in their production. In this way, specimens of nearly all the flowers, fruits and vegetables grown, are exhibited in their respective seasons, and much valuable information is disseminated.

After dinner, the meeting is called to order, and reports from the committees on exhibits are read; and then the standing committees on orchards, vineyards, small fruits, ornamental planting, ornithology, entomology, botany, and forestry, offer reports or make remarks on their various subjects. During this time, all who are disposed, may ask questions or make remarks.

Then the essay is read and discussed, and the time for adjournment always comes too soon. The essayist and place of meeting are selected by a committee, and our proceedings are always published in from two to four papers. We have about fifty members, and as the attendance is good, we are not particularly anxious to take in more—although we never refuse admission to any. We have some money in the treasury, and we owe nothing. A short time ago we purchased four dozen knives and forks, for twenty-four dollars.

We are fortunate in having plenty of competent persons to prepare papers or serve on committees, and there is no indispensable person in the Society.

The most memorable event of the year, was our meeting with the Eastern Cuyahoga Horticultural Society, in September. The meeting was held at the residence of H. Cushman & Son, of Euclid. About twenty of our members accepted the invitation, and took an early train at Cuyahoga Falls. They were met by Euclid friends, who took them in carriages through Wade Park, Lake View Cemetery, and some of the noted Euclid vineyards. Nothing was left undone to make it an occasion of great pleasure and the remembrance of it will always be delightful.

EASTERN CUYAHOGA HORTICULTURAL SOCIETY REPORT.

BY MRS. W. H. SLADE, SECRETARY.

Another year has drawn to a close, and with it, twelve very interesting and successful meetings of the Eastern Cuyahoga County Horticultural Society. Our Society is young, but made of excellent material, and all are zealous workers.

At our January meeting, the officers elected for the year, were as follows:

President—Mr. E. H. Cushman.

Vice-President—Mr. Wallace Dillie.

Secretary—Mrs. W. H. Slade.

Treasurer—Mrs. J. W. Maxwell.

Executive Committee—Miss Carrie Dunham, Mrs. A. P. Stevens and Mr. H. P. Winters.

Thirty-five names were enrolled at this meeting, and since then, fifteen more have been added to the list.

Miss Gertrude L. Cushman read an original essay on the subject, "What fruit is it?" She carefully and skillfully traced it (the pear) from its origin in Syria, to the time when the thrifty housewife had its fruit stored away in cans.

The subject discussed at the February meeting was, "How does Snow benefit the Horticulturist?" and Mr. Charles Dillie read a very interesting paper on the theme, "Why an Agriculturist should have a college education."

At our meeting in March, Miss Keys read an excellent paper on "Her Trip to the Wilds of Texas, in 1877."

A beautiful poem, entitled "A Golden Wedding," was read by Miss Carrie Dunham.

Mr. W. H. Slade read a very interesting paper on "His Trip to California;" and Miss Minnie Avery had an essay on "The History of the Rose."

"Interior Decorations for the Home," were discussed by Mr. John Dunham, at the April meeting; and Miss Allie Camp had an original essay on "House-cleaning."

"The Deacon's Week" was the theme of Mrs. Idding's paper; and Mrs. W. H. Slade read "Uncle Ezra's Story."

At this meeting a committee was appointed to make arrangements for the observance of Arbor Day. On said day, the members of our Society planted trees in the different school-yards, and in the evening, an entertainment was given at the Baptist church, in Euclid, consisting of readings, recitations and vocal music appropriate to the occasion, assisted by scholars from each district, who took an interesting part in the exercises. Rev. Mr. Warren made appropriate remarks, urging the necessity of planting trees, for the purpose of embellishment.

Subject discussed at the June meeting was, "The Early History of Horticulture."

At the July meeting, each lady wore a flower of her own selection, and gave a history of it. Several varieties were introduced, which made this meeting very interesting.

We resolved, at our meeting in August, to invite the Summit County Horticultural Society to meet with us in September, at which meeting members of our Society met them at the cars, driving through Wade park, and showing them the principal points of interest, on their route to Mr. Cushman's, where refreshments were served by our Society, and after the collation, the afternoon session was devoted to the reading of interesting papers, and music. Addresses were made by members of the Summit County Society, after which our Society adjourned, and our visitors were conveyed to the train.

A pleasant feature of the October meeting, was our grape exhibition. About thirty varieties of choice grapes were exhibited, together with a fine display of peaches, pears, apples, quinces and tomatoes; a turnip weighing 10½ pounds, and a rutabaga weighing 18 pounds, also formed a part of the exhibit.

The lady members try to excel in Floriculture, or more especially in the culture o

the chrysanthemum; and in November, had the pleasure of exhibiting, at the Baptist church, in Euclid, about 100 plants, including the Chinese, Japanese and Pompon varieties, which, together with other decorative plants, made the reception a grand success. Festoons in evergreen, intermingled with hawthorn, gracefully hung from the ceiling and windows. A massive bank of this beautiful fall-blooming flower was arranged in the rear of the church, in a semi-circle, over the center of which hung the motto, "Queen of Autumn," bordered with the blossoms of the chrysanthemum; and over the front entrance was arranged another motto: "Flora's Farewell to Summer." In each corner was a very large oleander tree, on the branches of which were fastened clusters of the scarlet geranium. Many were puzzled, and expressed a great deal of wonder, how the oleander was made to blossom so late in the season. In the center of this massive bank, was a chrysanthemum trained to form a Chinese fan, and in front of this, was another chrysanthemum in the form of a Japanese parasol. On one side of the center, was a large round bed of geraniums, and on the opposite side, a bed of pansies. A standard chrysanthemum, measuring eight feet in height, was the center of attraction. Carnations, fuchsias, callas, ferns, and bouquets of cut-flowers, chrysanthemums and dahlias, arranged with great taste among the chrysanthemums, made indeed a grand display, which will not soon be forgotten by those who had the pleasure of viewing the exhibit; and the ladies feel encouraged to try and excel, another year, in the growing of this most beautiful of all fall-blooming flowers, which is second only to the rose, and may truly be called "Queen of Autumn."

Mrs. Wyllis Dillie read a very interesting paper at the November meeting, on the "Cincinnati Exposition;" and the subject of potato-raising was introduced at the December meeting, by Mr. Wallace Dillie. At this meeting, our Society accepted an invitation from Mr. Dean, President of the Portage County Horticultural Society, to meet with them at their June festival.

Our Society is young, hardly three years since its organization, and no doubt there is plenty of room for improvement, but all the members are active and persevering, and it only needs time, to place ourselves on a footing with older Societies than ours.

M. T. THOMPSON'S REPORT ON BERRIES.

To the Members of the Ohio Horticultural Society, at Troy, Ohio:

I would say, after another year's trial of the Haverland Seedling Strawberry, I find it the most productive of any berry I have yet tried; very healthy, and a wonderful runner; and this year, to my surprise, was the earliest to ripen of any of my young plantations.

From all reports I have heard so far, I can recommend this berry as being the best berry yet introduced, and am confident it will lead any variety so far introduced.

The Gandy's Pride, I find a very beautiful berry, and well worthy of trial. In late-ness I find it about the same season as the Mount Vernon, but not as productive, but finer and much brighter color, and easier to pick.

The Belmont, I have fruited two years, but of little value.

The Mount Vernon, I find the most productive late berry.

The old Wilson, I still find, with me, as good as ever.

The Gypsy, I find a very pretty and early berry, and very healthy, and well worthy of trial.

Fay's Prolific Currant, I find has given me better satisfaction this year than ever before.

After fruiting Thompson's Early Prolific Raspberry another year, I still find it the earliest red, a strong grower, and very healthy, and seems to be doing well in the South,

where so many other varieties fail. I still think it well worthy of trial in a small way, at first.

The Rancocas, I find a failure, or nearly so.

The Crandall Currant I have not yet fruited, but I find it a good strong grower, and throws up a number of suckers differing from any other currant I have ever tried.

Gooseberries. I find the Houghton, so far, the most profitable.

Black Raspberries. I still find the Doolittle the most profitable.

The Erie Blackberry fruited for the first time, and think it well worthy of trial.

OBITUARY.

The State Horticultural Society has been called to mourn the loss of its honored and beloved President the present year; a man who endeared himself to every member of the Society, and who commanded the respect of all with whom he was brought in contact, either in business or social relations. His wisdom, his uniform courtesy and kindness, together with rare executive ability, will long be remembered by his fellow-members. The following notice, taken from the *Willoughby Independent*, of the services held in honor of the deceased, together with a sketch of some of the most important events of his life and history, will be read with interest by his many friends:

HOSMER GRAHAM TRYON.

The services connected with the funeral of Hon. H. G. Tryon (whose death occurred on the evening of the 29th of April, 1889), took place at the family residence on Waite Hill, Thursday-afternoon, the 2d inst. Probably no larger attendance has ever been known in the west part of the county on a similar occasion. Drawn from all portions of the country, and all classes—from the humble laborer to the State legislator—testifying to the great and irreparable loss experienced, as well as an expression of sympathy towards the stricken children in this double affliction. The Rev. A. J. Waugh, of the Presbyterian church, officiated, in the reading of selected passages of Scripture, a short address on the "ministry of sorrow," and closing with a biographical sketch of the deceased, which we give in full below. After which, Hon. E. L. Lampson, of Jefferson, Speaker of the House of Representatives, made a few remarks of a pathetic and touching nature, alluding to his intimate acquaintance with Mr. Tryon during the sitting of the legislature, the admiration formed for him, and to his industry, conscientiousness, manliness and general christian character. During the delivery of his remarks, he was deeply affected as well as were his hearers. The music was by a quartet composed of the same individuals who sang at the funeral of Mrs. Tryon—Mrs. J. A. Bartholomew, Mrs. W. H. Johnson, E. D. Billings and L. W. Penfield—the selections being peculiarly appropriate, and tenderly rendered, and closing with the ever popular and consoling strains of

"Gathering Home." The five children were all present—Mrs. Lilian Curtis, Miss Jennie Tryon, and Messrs. Charles D., Arthur G., and Howard H. Neither of the daughters were present at their father's closing hours; Mrs. Curtis, of New York, with her husband and two children arriving on Tuesday-noon, and Miss Tryon coming from Denver, Colorado, late on Wednesday night. In addition to these was the brother, Mr. J. H. Tryon, the only surviving member of his father's family. Among those present from a distance, besides Speaker Lampson, were Hon. W. P. Howland, of Jefferson, and Hon. J. J. Stranahan, of Chagrin Falls, both of whom had served with Mr. Tryon in the Legislature. The remains were deposited in the vault of this village, and will be finally laid in the cemetery on the Hill, and within a stone's throw of the homestead, where repose the parents of Mr. Tryon, his infant child and beloved wife, together with Mr. and Mrs. Dexter, the parents of Mrs. Tryon. The pall-bearers on the occasion, officiated in a like capacity at the funeral of Mrs. Tryon, in September, last, viz.: Messrs. A. P. Barber, R. C. Bates, and J. H. Merrill, of Willoughby; S. R. House and W. P. Whelpley, of Painesville; Thos. M. Morley, of Mentor. Letters of condolence and sympathy have been received from President Scott, of the State University; Hon. N. H. Albaugh, of Tadmor, O.; Hon. Geo. W. Campbell, of Delaware, O.; Hon. A. F. McKelvey, of St. Clairsville, O.; Messrs. L. B. Pierce, of Tallmadge; W. W. Farnsworth, of Waterville, etc.

BIOGRAPHICAL SKETCH.

The Hon. Hosmer Graham Tryon, whose unexpected death has given such a sudden shock to us all, was born October 27, 1825, in New York State, near the little village of Vernon Centre, Oneida county. The beautiful hills and valleys of that central portion of the Empire State, so familiar to the present writer, who himself was born among them, were cultivated by a thrifty and hard-working brotherhood of farmers. The father of our departed brother was one of these, and brought up his boys to severe and constant toil. These composed the family after the loss of a sister, who only lived some five summers. Hosmer enjoyed few advantages for gaining an education, but such meager privileges as he did enjoy, he must have improved with eager and diligent application, for he became not merely an ordinarily educated man, but one considerably broadened by culture. The intermittent attendance at the district school at the corner of the county roads, was all that he had, until nearly, if not quite, 21. Then he sought a little wider field of knowledge in a higher grade of school near by, and it was probably there that he met that one who was to be so much to him for the next forty years, the mother of these dear children, his beloved and faithful wife. Lovely in their lives, in death they were scarcely divided. Miss Irene Dexter was betrothed to him before he came first to Ohio, which he did in the spring of 1847; but they were not married until he had hewn out a name and home for himself in what seemed then the distant west. He here, and she there, how far they were apart! And what was here where now his home and farm are situated, way back in the spring of '47? A forest of girdled trees. Upon the clearing of this away, he entered with a young man's zeal and with the prospect of a happy home and future before him. These he gained, for, in 1850, after a rugged three years spent on the primeval Waite Hill, he returned to New York State, and was wedded to Miss Dexter. They started for their new western home by going as far as Buffalo on the lately opened railroad; thence by boat on Lake Erie, as far as Fairport, and thence overland. Two years later, Mr. Tryon's father and mother followed the young man, living on the other side of this highway, and both having departed this life several years ago.

Such was Mr. Tryon's start in life, and his career more than fulfilled the promise of such a youth. Already, as a boy in school he was looked up to and admired as well as esteemed for his integrity and moral worth, which ever abode the same until the day of his death. And now I wish to speak of our brother's public life, for he was not simply almost a model farmer and fruit-grower. He was a public man in a much larger way. The old Willoughby College found in him a warm friend and liberal patron. He was largely interested in the progress of the institution, and served for many years on the

Board that managed its affairs. At the time of his death, he was its honored President. In horticultural and agricultural societies, local and State, he was an active worker, and few men, even in the great agricultural Ohio, have done more with hands, tongue and pen for the improvement of the farmer and the mental, esthetic and moral elevation of that manly calling. Surely by the picture in his parlor of the group of farmers composing the agricultural committee in the State Legislature, shows to the observant eye a class of men as tillers of the soil, hard to surpass, if not to equal, in any other State in our broad Union. There was scarcely any association in the county or this section of the State where his voice was not heard, and he was constantly preparing papers pertaining to those subjects on which he was regarded as an expert. He was not only a member of the State Board of Agriculture, but also President of the State Horticultural Society, serving now for the second year. Fairs constantly took him from home in the fall of the year, and the reputation of Lake county, as a fruit-growing section, was very largely enhanced through his efforts, and many prizes found their way to Waite Hill, until his little garden spot, where we are to-day, was quoted far and wide.

Mr. Tryon was an earnest Republican in politics, but not a partisan; quiet in his social life, and intensely fond of his home, he was drifted in the political life, almost against his will. At Painesville, in 1873, at the convention of the workingmen, owing to dissatisfaction with the regular Republican nominee, he was nominated as the representative from this county to the State Legislature. Under such circumstances, men are not usually elected. Party spirit counts for much, and, if a thorough canvass be made on the other side, little hopes can usually be entertained for victory. Mr. Tryon felt the embarrassment of the situation, but he was not only elected against all opponents, but with a handsome majority.

Thus he entered upon a much wider field of usefulness, some sixteen years ago. For two years he served, and was initiated into the duties, privileges, and trials of a legislator. That he performed his obligations conscientiously and well, is evidenced by the fact that he not only pleased his constituency, but in the fall of 1875 was again nominated for the same public position, and that not by the workingmen's convention, but as the regular Republican nominee. Again he was elected, and fulfilled the duties of the office for the term of two years. He was the author of several local bills, and probably few men in public office ever kept their eyes more open to the good they could achieve for their own section of the great commonwealth. For the next ten years, though not in public life so much, our brother busied himself in hard work in the ordinary channels open to him, beautified his own surroundings, and attempted to keep himself and those about him, abreast of the latest improved methods and appliances. The character of his library, and of the many newspapers in this home, shows the character and drift of his life. Two years ago, in the fall of 1887, the Republicans called upon him again to represent Lake and Geauga counties at Columbus. God permitted him to serve out his full term, but it was with labor and sorrow—and the Scripture leads us to say further, for he was "soon cut off." The deepest sorrow of his life, that sorrow from which he never recovered, occurred in this beautiful home last fall. With scarcely a moment's warning, that one whom he had loved with all the love of his heart, the wife of his youth, the mother of his children—that one for whom he had made the toilsome journey to the old eastern home, and with whom he had made the long journey here again, was taken from him. Mr. Tryon was never a man of words or a trumpeter of any of his private affairs; but I was permitted to read in his face, and in the manner in which he was bowed with grief in church, the sorrow from which he never recovered. Still he did not flag in his duty. In the legislature he introduced that which was known and designated as "the Tryon Road Bill." Upon the preparation of the different sections of this bill he spent much time and thought, and he attempted to push its passage in its application to the entire State. In this he failed, as all such laws are of slow growth; but it became a law in its application to Lake and Geauga counties. There its beneficent provisions will be tested, and the future may confirm his wisdom in the matter, even beyond his most sanguine expectations. In evidence of this, it may be stated

that he was in receipt of letters pertaining to the provisions of this bill from various portions of the country. To remember the difficulties under which he labored in the gaining of what education he enjoyed, is to convince any one that all educational institutions, expedients, and improvements met his hearty approval. He favored township superintendence, thus keeping even the district schools more abreast of the times. For several terms he was chairman of the township board of education.

Mr. Tryon never accepted a pass during all the time he served at Columbus. This reveals one of the stern qualities of the man. He went to the State House in the interests of the people, not to take his ease, not to draw the salary, or to receive anything from the hands of any man or railroad company that would in any way compromise his principles or his vote. He was active in all temperance legislation, and, O, how he abhorred the drink demon! It may also be of interest to state that he favored female suffrage, feeling this would help to solve the temperance problem. He was also chairman of the Committee on Universities and Colleges. Locally, every farmers' institute can testify to his encouragement and support. He was elected as a trustee of the Presbyterian Society, in Willoughby, on January 4, 1883, and served in that capacity until January, 1884.

But it was ordered that he should not long survive his wife, whose loss he mourned so deeply. For the last few months, he seemed to be living only for the two younger children; one gaining an education at Columbus, the other seeking health in the mountain air of the distant west. The others, he felt were well settled in life; but for these two he lived. But last February he caught a severe cold here, from which he suffered after his return to Columbus. He was scarcely well enough for the trip to Washington to the inauguration of President Harrison. He took this, however, and gradually ran down—little aware himself, probably, of the deep-seated nature of his disease. In great weakness and suffering he continued to attend to the duties of his position during the closing days of the legislative body; and is said, even under these circumstances, to have answered to his name more times than any other member of the House. After his return home, he failed rapidly; yet he even went to Willoughby a week ago, and walked home again. Quickly then did the fell disease of the lungs do its work; and peacefully, without even a murmur, he breathed his last. His reason was with him unto the end.

And now let me come close home to the inner characteristics and graces of this man whose loss we mourn to-day. His truest life was in the home. It is usually thus with kind-hearted, reticent men. He lived in and for the lives of his wife and children. Of the latter, God gave him six; one died as an infant, in October, 1860; the other five survive him. Seven grandchildren compose these three families left. Mr. Tryon was a good, kind, honored and sympathetic man. In his dealings with his fellow-men, he seemed to adopt the golden rule. He never sought to take advantage of any one, but what appealed most to him, was not his own advantage over the other, but the other's need. Mrs. Tryon and himself were remarkable for their kindness and sympathy during a neighbor's sickness or distress. The two were much alike—he in his manliness and refinement, she in her womanliness and grace. Never, it may almost be said, was our brother known to lose his temper. And the sweetness and happiness of the home-life of these two souls—who can tell it? What models in their mutual love and unflinching kindness of speech! The children cannot remember the unkind word of father to mother or mother to father. Would that these virtues might shine elsewhere in ten thousand homes! His dying words echoed the sentiments of a life-time and gathered up into a little bundle of broken syllables, a world of meaning to the son who heard them: "O, Charlie, I cannot tell you what a deep affection your mother and I have always had for you children." He will be deeply mourned here in his home; but God has been good, as the children, one and all, feel, in sparing them so many years and in setting before them so many virtues. You neighbors will miss the familiar face and form. The church will miss his presence, financial and moral support; but God's will be done! May God's richest blessings rest upon us all! Amen.

The above is an excellent outline of Mr. Tryon's career, yet columns might be added to it without exhausting the subject. It has been truthfully said of him that no spring-time was allowed to pass without adding to his stock of fruit or ornamental trees. For this and other reasons, his farm became one of attraction and notoriety for its order and productiveness; and the late Colonel S. D. Harris, a gentleman of extensive observation, and at one time editor of *The Ohio Farmer*, after a visit, pronounced it "one of the beauty-spots of the world." * * * *

Besides making something of a specialty of the fruit-culture, he at one time united with his farming the art of fish-culture; and demonstrated that those gamy and most delicious of all the finny tribe, the brook trout, may be successfully grown in the spring waters of Ohio. Many a time has the writer visited the spring and pond where the fish were grown, and witnessed the interest and pleasure afforded the proprietor in this novel industry. * * * *

From his earliest youth, when Garritt Smith, Beriah Green, and others opened the anti-slavery agitation in New York, he heartily espoused the anti-slavery cause, and adhered to the party in sympathy long before he became a voter, until the organization of the free-soil party at Buffalo, in 1848; since which time he had been an earnest supporter and advocate of the principles upon which the Republican party was founded. *

At the breaking out of the rebellion in 1861, the complicated business affairs and situation of his family, greatly to his regret, prevented his enlisting in active service; but in all else that pertained to the success of the Union army, he took an active part. He was elected captain of a company of home guards, and on the re-organization of the State militia in 1863, received a commission as first lieutenant of a company, and was appointed adjutant of the regiment by the commanding officer, Colonel Andrew Houlston. * * * *

Perhaps in no matter was he more persistent than in his efforts to induce the laboring classes—especially the farmers—to give their children a thorough education, scientific and classical, if consistent, without allowing them to lose sight of the great importance of productive labor and the necessity of maintaining a respect for their calling—thus to place the producers, in intelligence, social qualifications and in the halls of legislation, on an equal footing with professional members of society. * * *

Mr. Tryon, as well as his wife, was an enthusiastic lover of vocal music, and made sacrifices in order to promote its spread and efficiency. The older attendants of the South Kirtland church will remember the interest and pleasure both of them took in the public musical services. Their home was the rendezvous for the singers of the vicinity, and the members of the old Lake and Geauga Musical Association were royally entertained whenever the conventions were held in Kirtland or Willoughby. * * *

Although not strictly speaking a "church member," he lent his influence to the building up of church organizations as an important source of enlightenment and protection to the morals of a community. In his views of church government, he favored the Congregational plan. As has been remarked, he followed the "golden rule," and such an one is "not far from the kingdom of God." Perhaps a quotation from the Master's words, and used by Prof. Gist in his admirable tribute to the religious life of Mrs. Tryon, may not be inappropriately used in the case of our beloved friend—"And other sheep I have which are not of this fold; them also I must bring, and they shall hear my voice; and there shall be one fold and one shepherd."

APPENDIX.

MEETING OF THE AMERICAN POMOLOGICAL SOCIETY, AT OCALA, FLORIDA.

BY GEO. W. CAMPBELL, SECRETARY.

The twenty-first session of this old and influential Society, was held at Ocala, Florida, on the 20th, 21st and 22d of February, 1889. This was quite a new departure; from former usage, as the meetings have heretofore occurred in the autumn, usually about the middle of September, and in the Northern States; one meeting in Richmond, Va., and one in St. Louis, Mo., being the only exceptions. The election of a southern President, upon the death of the revered and honored Marshall P. Wilder, doubtless had an influence in the appointment of a southern locality for the meeting; and although it was out of the usual course, it was well attended, and the proceedings of full average interest. Many new members were added to the Society; and the people of Ocala and vicinity received the members of the Society very cordially, and extended them many courtesies during their sessions. The railroad companies also gave free transportation for all members to points of interest throughout the State.

The first meeting of the Society was held on the forenoon of the 20th, in the large Semi-tropical Exposition Building, President Prosper F. Berckmans presiding.

About 400 persons were present, including many ladies. Fourteen States were represented, the number being afterward increased to twenty-two.

The stand was decorated with flags and banners, and situated in full view of the magnificent exhibit of fruits and flowers. Among the offerings upon the table was a beautiful floral fan, presented to the President by the ladies of Lake county, Florida.

The rustic orangewood gavel, used throughout the sessions, was a souvenir of the old Florida Fruit Growers' Association, the origin of the present Florida Horticultural Society, and was presented by its former Secretary, Col. D. H. Elliott.

The meeting was opened with prayer by Rev. C. B. Wilmar, of Ocala, after which Mr. Dudley W. Adams, President of the Florida Horticultural Society, delivered the following

ADDRESS OF WELCOME.

Mr. President, and Members of the American Pomological Society:

During my somewhat busy life, it has been my good fortune to perform many very pleasant public duties, but among them all, none ever gave me more pleasure than now, in behalf of the infant State Horticultural Society of Florida, to receive as our guest that full-grown giant, the American Pomological Society.

To be thus honored by the presence of the foremost Pomological Society of the world, would seem to fill to the brim, our cup of satisfaction; but when, as to-day, we

can also take by the hand that stalwart organization, the State Horticultural Society of our big sister, Georgia, then, truly, our cup runneth over.

With the reverence due from youth to age, with the respect due from the student to his teacher, with the affection due from the child to his parent, we bid you welcome to our State, our city, our homes, and our hearts.

On account of universal and sturdy usefulness, by acclamation, the Apple has been called the king of fruits. So, for her sweetness in the bloom of infancy, her beauty, grace and goodness in the flush of womanly maturity, shall the Orange, undisputed, wear the queenly crown. As a loyal subject of our beautiful queen, I bid you welcome to this, her chosen realm. Here she reigns supreme, and other fruits which in less favored climes would wear a crown, are proud to be seen in her retinue. Her citrus sisters, the lordly pine-apple, the peach, and pear, and grape, the guava, banana, mango, strawberry, kaki, loquat, a horticultural aristocracy of purest blood, are her most loyal and faithful subjects. As her loyal and most humble representative, I am authorized to offer you the freedom of her dominions, and express the hope that when your duties here are done, you will accept her invitation to travel all over her domain, from ocean to gulf, from Georgia to the Keys, without money and without price.

Come with us to our villages and homes; get acquainted with our sturdy live-oaks and our graceful palms; go among our stately pines and our climbing jessamine; take full draughts of our healing air; take kindly warmth from our Southern sun; and when you return to your own loved homes, carry with you kind memories of your short sojourn in the realm of our "Golden Queen."

The following telegram was then read:

"TALLAHASSEE, FLORIDA, February 19, 1889.

"To the Gentlemen of the American Pomological Association:

"In the name and in behalf of the State of Florida, I extend to you a cordial greeting and a most hearty welcome, with the earnest hope that every hour of your visit to our State may be one of pleasure and enjoyment, as it will be to our people to entertain you, and that Florida, in her offerings to you of the bounty of her products and her pomological exhibits, may establish her claims to the designation of the land of fruits as well as flowers. My only regret is that official duties deprive me of the pleasure of greeting you in person.

"F. P. FLEMING, Governor."

Mayor Thomas P. Gary then presented the following

WELCOME TO OCALA.

To the President and Members of the American Pomological Society:

Through me, their mayor, the citizens of Ocala extend to you a cordial and heartfelt welcome and the freedom of our city.

It is indeed a great privilege to be permitted to welcome you, and an additional evidence that Florida, though young in the arts and sciences, has within a few short years, by the cultivation of the citrus family and other tropical fruits, placed herself in line with other States in horticulture and pomological productions, and need not be ashamed of the progress made in that direction. We feel that your presence and deliberations will be of incalculable benefit to us, and will result in much good to the cause you represent.

Trusting that each and every one of you will return to your respective homes pleased and amply repaid for the sacrifice made in coming to Florida and Ocala, I again welcome you, and thrice welcome you to the freedom of the exposition and our beautiful city.

The President of the Semi-tropical Exposition, Mr. Geo. W. Wilson, then greeted the assembled pomologists in behalf of the Directors of the Exposition, and extended to them the freedom of the building during their stay in the city.

The delegates having thus been more than thrice welcomed, President Berckmans felt called upon to respond in their behalf, but as he was suffering from an affection of the throat, he requested Mr. W. C. Strong, Vice-President for Massachusetts, to perform the office.

Mr. Strong expressed in fitting words the gratitude of the Society for the warm welcome which it had received, and said that although this was the first meeting that had been held south of Richmond, it was not because there had not been worthy members of the Society in that portion of the country, but because the fruit resources of the south had been comparatively undeveloped.

The Society was glad of the present opportunity to hold its meeting in the extreme south, and to observe the enterprise of its pomologists, and the rapid growth of the fruit industry in that part of the country. The members were glad to be able to renew old acquaintances and form new friendships with those in kindred pursuits. They would return to their homes with renewed zeal for their work, with broader knowledge and added experience, of benefit to themselves and the entire country.

The usual Business Committee, Committee on Nominations for Officers, and other necessary committees were then announced, and accepted by the Society.

The Society re-assembled, at 3 P. M., in the Opera House, where all subsequent sessions were held, to hear the biennial address of President Berckmans, from which we extract the following:

THE ADDRESS.

Ladies and Gentlemen of the American Pomological Society:

Your Constitution requires, from your presiding officer, "an address on some subject relating to pomology, at every biennial meeting." * * *

The origin of the American Pomological Society emanated, not only from the necessity of advancing the progress of an industry, which, half a century ago, was already considered as one of the great factors in the production of our national wealth, but also from the desire of its founders to unite all the fruit-growers of the American continent, in one vast brotherhood. These principles were patriotic, and eminently practical, in accomplishing, by social intercourse, and a free exchange of knowledge, the objects which were aimed to perfect. As a nation progresses in refinement, there is a corresponding increase in the multiplicity of its wants, and a consequent necessity for their abundant supply; as such wants are the natural results of increased labor, so increased labor must meet the demand of supply. * * *

Private enterprises, whose object is the production of pomological commodities for commercial purposes, have special organizations for specified results. Such organizations deserve the cordial commendation of this Society, for the many benefits they bring to every community in the land, and for practically aiding in carrying out the work of this Society.

In the future reunions of men animated with but one desire, the advancement of an intellectual and refining pursuit, rests the perpetuation of this Society, its strength and usefulness. So long as this policy is pursued, so long will this Society remain the fostering source from which American pomology has become a rich mine of pleasure, bodily comforts, educational progress and financial returns.

I used the term *patriotic* when referring to the principles which governed the men to whom we owe the existence of this Society.

Horticulture was the basis upon which these men anticipated building successfully. The magnitude of the horticultural taste everywhere visible, is mainly due to their un-

tiring efforts. Well do such men deserve the grateful recognition of those who are reaping the benefits of their labors.

European pomologists have long since recognized our Society as the most influential of its kind in existence; our proceedings are quoted by foreign horticultural publications, as models worthy of imitation, and that under its auspices American pomology has made most wonderfully rapid progress, while in their own countries a similar result has been slow.

Most enviable is the lot of the American farmer, owner of the land he tills; he works with the assurance that, whatever outlay of labor or money he devotes to its improvement, the benefits resulting therefrom will be his own. This leads to a desire to improve the products of the soil, and thus to contribute to the material progress of this great nation. In contrast with this sovereign condition of our own pomologists, the European farmer, being seldom other than a temporary tenant, has no incentive to improve permanently the land of another, or the quality of such products, as may not benefit himself in the near future. As a tenant, he knows that in making his landlord's land more productive, he will likely be made to pay an increased rental. Pomological progress being therefore, confined to a very small proportion of European freeholders, as compared with our own, is necessarily deprived of the vast amount of research and discoveries which are within our own people. Again, it is undeniable that the market value of purely agricultural lands is inferior to those devoted to pomological products. The pomologist not only gives the most refined and valuable products to the food supply, but by his more scientific knowledge of cultivating the soil, adds largely to the public revenue by increasing the taxable value of his land.

Fruit-growers of this fair Land of Flowers, to you belongs the honor of having aided more materially to the wonderful development of your State, than any other class of men.

Our venerated friend, Mr. Wilder, never uttered a truer sentiment than when he said, "After all, we pomologists are of some use to mankind."

These words should be preserved by us, as emblematical of the importance of our pursuit.

Permit me to call your attention to a few subjects appertaining to the scope of this Society, and which may, perhaps, be considered of sufficient importance to be discussed, in the course of your deliberations.

PARIS EXPOSITION.

It is most creditable to our general government that the necessity of giving the pomological products of the United States official recognition in its participation in this forthcoming event is fully recognized. The results of the collective exhibits of the various products of this continent, do not merely open additional markets, but will ultimately prove potent factors in uniting the people of this grand Republic in closer bonds of mutual interest and harmony. Of late years, it has become obvious that American Pomology should receive due recognition by Government aid. It is therefore a source of congratulation that its importance has lately been considered sufficient to cause the establishment of a

DIVISION OF POMOLOGY,

by the United States Department of Agriculture, under the care of the Secretary of Agriculture. The Division of Pomology has done excellent work. His efforts to promote its usefulness are worthy of commendation, as well as the liberal support of all American fruit-growers.

EXPERIMENT STATIONS,

which by act of Congress are now either established or in process of organization in every State of the Union, will greatly increase the facilities for advancing pomological knowledge.

In a few States, these stations have been established sufficiently long to have demonstrated their usefulness, and have already left their imprint upon many products which have visibly improved through their influence. Where such stations are about to be established, the task of properly organizing will be arduous. There will be little of past work to build upon, successful results must therefore be comparatively slow, unless our zealous fruit-growers unite their efforts in aiding the officers in charge with their knowledge and practical experience, and thus lessen their difficult task and yield the speediest and best returns.

UTILIZING SURPLUS FRUIT.

This problem, which has been for some years past, a practical subject for the consideration of American fruit-growers, seems for some sections, and for certain classes of fruits, near a satisfactory solution. It is a patent fact that the free use of sound fruit conduces to hygienic as well as temperate reform.

The perfection attained in producing evaporated fruit would demonstrate that when an over-supply can thus be converted into a wholesome article of food, easily preserved for future use, we are safe in extending the planting of such fruits as can be thus utilized. As the foreign demand is increasing for American products, it is to be anticipated that still greater improvements will be made in the methods for their indefinite preservation.

The President very feelingly and appropriately referred to the losses the Society had sustained, since its last session, by the death of the following honored and useful members:

Judge Wm. Parry, Vice-President for New Jersey, who died at his home in Parry, N. J., February 27, 1888.

Richard Peters, of Atlanta, Georgia, a life-member of the Society, who died February 6, 1888.

David S. Myer, Chairman of the General Fruit Committee for Delaware, died at his home at Bridgeville, Delaware.

The address of President Berckmans was listened to with deep attention, and received with applause at its close.

The report of the committee on nominations was then called for, and President Prosper J. Berckmans, together with the officers of the past two years, were nearly all re-nominated, and unanimously elected. A. A. Crozier, of Ames, Iowa, was made permanent secretary, having previously held the office by appointment, to fill the vacancy caused by the resignation of its former very efficient secretary, Chas. W. Garfield, of Grand Rapids, Mich., on account of failing health. Benj. G. Smith, of Boston, Mass., was elected treasurer. T. T. Lyon, of Michigan, was made First Vice-President; Geo. W. Campbell, Vice-President for Ohio; Matthew Crawford, of Cuyahoga Falls, member of the General Fruit Committee for Ohio.

After the election of officers, an essay was read by Prof. J. C. Neal, of the Experiment Station of Lake City, Fla., upon the cross-pollination, or hybridization, of plants. Much discussion followed this paper, without arriving at any very definite or satisfactory conclusions, beyond the facts that were already established. The matter which seemed to be of most interest, was the question whether the pollen produced any effect upon the character of the fruit in the same year that the cross-fertilization was made. Many reports were made of various changes in the appearance of oranges, pears, apples, melons, and other fruits, when grown in immediate proximity with different varieties, where their character was so changed and the fruits were so mixed, that they appeared to have been

produced upon the "wrong tree"; and these effects were attributed to the cross-fertilization by the pollen of the same year. Others, who had never seen any such effects, doubted. President Berckmans reported having seen upon a Vicar of Winkfield pear tree, which was planted near Seckel and Flemish Beauty trees, a branch bearing specimens resembling Seckel, Flemish Beauty and the true Vicar. He had also seen branches bearing both peaches and nectarines, where trees of the two varieties were growing near each other. Mr. Phelps of Florida remarked that this discussion reminded him that he had long ago discovered how much there was that he did not understand. Prof. Neal related, as pertinent to the subject, and the discussions closed with the statement, that a marriage between a black man and a white woman resulted in both becoming mulattoes.

A paper upon "Unsolved problems in Pomology" by E. S. Goff, of Madison, Wisconsin, presents some points of interest, which are given in the following extract:

What is the condition of our Pomology to-day? It seems hardly necessary to cite evidence to show that the crops of our larger fruits are far more precarious than are those of our cereals. A wheat crop that endures the winter, is practically certain to yield its grain. A corn field in which the plants are not destroyed before attaining their full stature, is sure to give its quota of ears. But how is it with our tree fruits? The trees grow to normal size, and, in the greater part of our country, pass the winter uninjured, but how often do they yield a normal crop? Occasional excessive yields are followed by two, three or more very scanty ones, and not infrequently the crop is a total failure. The indications are that our fruit crops are becoming more and more precarious. Entomologists and Mycologists tell us, and, indeed, we do not need to be told, that the injuries to our fruit trees, wrought by insects and diseases, are increasing. This is certainly not a pleasant state of affairs to contemplate. What are the causes, and what are the remedies? Surely here is a most abundant field for the experimental Pomologist.

The deterioration of our soil through exhaustive cropping, is doubtless one of the causes for the capriciousness of our fruit crops. The introduction of destructive foreign insects, is unquestionably another. But these causes can hardly account for it all, since our cereal crops are exposed to the same conditions, and, as has already been stated, these are far more certain in yielding their returns than are our larger fruits. Are these not causes inherent to our methods of propagation and culture?

Thus Mr. Downing said: "The apparent decay of a variety is often caused by grafting upon unhealthy stocks. For although grafts of very vigorous habits have frequently the power of renovating in some measure, or for a time, the health of the stock, yet the tree, when it arrives at a bearing state, will sooner or later suffer from the diseased or feeble nature of the stock. Carelessness in selecting scions for engrafting is another fertile source of degeneracy in varieties."

To what extent are our native plums and cherries capable of improvement?

The imported plum and cherry can hardly be called satisfactory in this country. The foliage of the former is weak, and its fruit can only be secured through an interminable warfare with the curculio. The trees of the latter are much subject to disease, and the fruit is liable to decay prematurely, and is much damaged by the curculio.

Attention should be given at our experiment stations to growing seedlings from our native species of these fruits, and especially to attempts at hybridizing our native species with the foreign ones.

We have been compelled to give up the foreign grape, and as the result, within the past few years, have sprung up a multitude of improved varieties of our native grapes. The same may be said of the raspberry. Had our other imported fruits proved as marked failures as have the grape and raspberry, we might now have been rejoicing in a long catalogue of improved native varieties better able to cope with our climatic conditions.

Allied to this, is the question whether or not the productiveness of our grapes may not be improved by giving the vines more room in the vineyard. An editorial note in the *Country Gentleman* for 1885, p. 108, contained the following: "When it was common in Cincinnati vineyards to train the Catawba to single stakes only a few feet apart,

a plantation in the neighborhood was planted with vines twelve feet apart from each other, and full space was allowed them to run. The bunches, when examined, averaged fully double the size of those on the vines trained to stakes."

To what extent may we use mulching with profit as preventive of injury from drought?

An experiment at the New York Agricultural Experiment Station showed that a mulch only an inch deep retained almost twice as much water in the soil during the driest part of the season as frequent cultivation to the depth of four inches. This suggests how great is the value of a mulch in times of drought in cases where it can be used.

Experiments at Geneva, indicate that Dr. Sturtevant's theory of seedless fruits has some foundation. Seedling currants and raspberries grown from few-seeded specimens, produced fruit of better average quality than those from others that had many seeds.

Although Pomology may present fair claims to being the oldest art, we have seen that it still has many unsolved problems.

A paper upon the subject of the "*Plum Curculio*, *Arsenical Sprays*, and *Weir's Wild Plum immunity theory*," was presented.

In this paper, the theory advanced by Mr. Weir that our native plums of the Chicasa and other kinds were nearly exempt from injury by the curculio, was discredited, and not found to be sustained by facts obtained by observation or experience.

The benefit of spraying with arsenical poisons in greatly reducing the injury of our stone-fruits, was conceded; and the most conclusive experiments recorded, were those of Mr. Clarence M. Weed, of the Ohio State University, which are published in the proceedings, also, of the Ohio State Horticultural Society, in this volume.

There seems now little doubt, that the intelligent use of the spraying process, will be found as effective against the curculio, and similar insects, which destroy our stone-fruits, as it has been against the codling-moth in the apple.

In a paper upon "*Results of Recent Experiments in the Treatment of Vine Diseases*," Prof. B. T. Galloway, of the Department of Agriculture, Washington, D. C., gave some interesting and useful information to grape-growers, from the results of experiments by the Department, in the treatment of vine diseases. He regarded these experiments as conclusive, as to the efficacy of the remedies recommended in the circular issued by the Department, in 1887, for the prevention of mildew upon the vines, which have been so extensively published, and are known as the French remedies, of which sulphate of copper and lime are the principal agents. The formulas for the making and using of these, are now easily accessible to all who need them; but the following have been recommended as probable improvements upon the "*Bordeaux mixture*," and the "*eau-celeste*," which are thought to be less liable to injure the foliage:

1st. Bordeaux mixture, modified formula, containing six pounds of sulphate of copper and four pounds of lime, to twenty-two gallons of water.

2nd. Eau-celeste, two pounds of sulphate of copper, dissolved in two gallons of hot water; in another vessel, two and a half pounds of carbonate of soda, in a similar manner; mix the two solutions, and when all chemical action has ceased, add one and one-half pints of liquid ammonia; then dilute to twenty-two gallons.

The experiments as to prevention of the black-rot, were not considered so decisive, but were sufficiently encouraging to induce a continuance of the experiments, with the promise of ultimate success. Some discussion followed, in which several parties spoke favorably of the practice of bagging grapes, as a preventive of rot, and also as a protection from the attacks of the birds and insects. The expense of bagging grapes was estimated to be one cent per pound. Mr. Newman, of Alabama, reported very favorably upon his experiments in bagging grapes the past season. He sold grapes that were bagged, at ten cents per pound. They were much finer in quality and appearance. Grapes grown in the ordinary way, brought only four cents. Of many varieties, the only perfect specimens he had, were those protected by bags. The others all rotted. He was very enthu

siastic in the recommendation of the use of paper bags, put on early, soon after the setting of the fruit, and he believed it would pay a large profit over cost, in his section.

A paper was presented upon "*The Packing of Fruits for Market*," by P. M. Augur, of Littlefield, Connecticut, which seems to cover the whole ground, and abounds in good advice to the grower and shipper: The first consideration in reference to this matter is to have choice fruit to pack. In order to have good fruit, there must be good trees, of such varieties as the markets call for, properly cared for in regard to culture and pruning. The trees, as soon as the fruit is fairly set, should be sprayed with *insecticides* and *fungicides* both. The requisites are to have smooth, uniform-sized and well-colored fruit, free from insect marks and fungus blemishes.

We must remember that no amount of skill in packing can make poor fruit any more satisfactory to the purchaser.

But having perfect, beautiful fruit, very much depends upon its proper handling.

Therefore, first, let the packages, whether barrels, crates, baskets, or boxes, be sweet, clean, neat, and attractive.

Second, let the fruit in any and every package be uniform in appearance, size, and quality, from top to bottom, from end to end.

Third, face the packages properly, not with specimens, better than the average, but place them with care, so that, on being opened, the fruit will show to advantage.

Fourth, pack snugly, so that there shall be no jostling, and bruising of the fruits rattling against each other.

Fifth, a most important consideration is, to pack and ship fruits in the proper state of maturity, allowing neither too green, nor over-ripe fruits, to go to market. This is especially important with tender-fleshed varieties. Over-ripe fruit, of such varieties, when shipped to distant markets, is quite sure to entail loss, upon both seller and buyer. Such fruits should be placed in home markets, with the slightest possible amount of bruising.

Experience should be the great regulator, in these matters.

Fruits should be graded, usually, into Firsts, and Seconds; but let both grades be such as you will not be ashamed of, such as you are willing to put *your brand* on, and remember that the packing of *trash*, under any brand, is sure to entail loss in the end.

BOTANICAL NAMES.

Dudley W. Adams, of Tangerine, Fla., read a paper, urging a simplification in botanical terms, and enforced his views, by presenting, in a humorous way, many of the difficulties which meet the student in botany, and, although he made some good points, his arguments did not seem to be regarded with favor by the scientific botanists who were present. A few extracts will present Mr. Adams fairly upon the subject:

Of all the sciences, botany is the most intimately connected with the art of horticulture.

A knowledge of botany enlightens the horticulturist, to his profit, and enlivens his mind to a fuller enjoyment of his chosen calling.

The study of botany brings the student into closer communion with Nature in all her loveliest and wildest phases.

It leads him among the green pastures, and beside the still waters.

He interviews the majestic palm under a tropical sun, and seeks the Eidelweis amid Alpine snows.

He explores the dark lagoons for the graceful lily, and braves the burning sands for the rigid cactus. The gorgeous orchid in all its glory, is his, and the humble mosses are studied on bended knee.

He loves alike, the flaming poinsettia, that flaunts its charms under the scorching

mid-day rays of a torrid sun, and the lovely cereus, that only reveals its beauty by the modest light of the twinkling stars. * * * * *

Such a science, which enlightens our understanding, introduces us to nature, increases our happiness, beautifies our homes, gratifies every sense of taste, touch, smell, hearing, and sight, touches the heart and fills the purse—such a science, we should expect every one to acquire.

Dut do they? Does everybody understand botany? Most emphatically, no.

Why? Yes, why? There must be some good and powerful reason for such a practically unanimous neglect of so pleasant and profitable a study. And this is the reason:

All the text-books on botany, so far as the nomenclature and descriptions are concerned, are written in a conglomeration, a veritable babel of dead languages, wholly unintelligible and unutterable. That is all there is of it, and that is ample to account for the situation.

Now, here is what the innocent student strikes at the very threshold of his efforts—see Wood's Botany. In the chapter on elementary organs, he finds that the skin is a cuticle. He meekly accepts that fact as scientific gospel, and tries to remember that skin is not scientific, and that cuticle is. When he turns over two leaves, he finds, to his dismay, that, speaking with scientific accuracy, skin is EPIDERMIS, in capital letters. That is a stunner. On the same page, he strikes "Lactiferous tissue." The meaning, at first, is not quite clear, but two lines further on, it is defined as "branched anastomosing."

He begins to realize that he is studying Botany, and in the next chapter reads: "The vegetable kingdom has long been considered, by botanists, under two great natural divisions, namely, Phænogamia, or flowering-plants, and Cryptogamia, or flowerless plants. The Phænogamia abound with ligneous and vascular tissue, while the Cryptogamia consist more generally of the cellular. Hence, the former are also called Vasculares, and the latter Cellulares. The Phænogamia are also called Cotyledonous, and the Cryptogamia, Acotyledonous plants."

Now, here are three complete sets of unintelligible, unutterable, polysyllabical names for the same thing. If that don't "knock out" our student for keeps, he is a good one.

If he again advances to the fray, he stumbles over "perianth," "achlamydeous," androecium and bracteoles. The corolla hurts his head, and the calyx cracks his jaw.
* * * *

All over the land, you can find text-books on Botany, covered over with dust and cobwebs. Examine them, and thumb-marks are seen on a few preliminary pages, but untouched leaves thereafter will show you just where the botanical aspirations and ambitions of the owner were wrecked.

I say right here, without fear of contradiction, that the experiment of using dead languages in the nomenclature and description of plants, has proved a *disastrous failure*.

When the American Pomological Society was formed forty years ago, the nomenclature of our fruits was in apparently inextricable confusion.

What did that Society do? Did it go to work and attempt to bring order out of chaos, by giving new names to all our fruits in a hodge-podge of Greek and Latin? Not much! The men at the head of that Society were men of good business, practical common sense, men of culture, whom cultivation had not emasculated, or removed from a substantial connection with the realities of earth. They grappled with the confused nomenclature of that day on the basis of talking English to one's English-speaking people, and we all knew what they were driving at. Like frost before the sun, synonyms disappeared, and order came out of chaos.

How rapidly the true name was accepted. How ruthlessly the long names were pruned down. The whole nation endorsed their common sense course. Wilson's Albany Seedling strawberry is known to all men as simply Wilson. Monarch of the West is simply Monarch. Vicar of Winkfield pear is pruned to Vicar. The Duchess d'Angou-

leme, a most magnificent pear, limped along for years in a vain attempt to become acquainted with a people who could not pronounce its name. The American Pomological Society has cut away one-half the name, leaving the Angouleme alone as the name. But for once even the American Pomological Society is not up to the demands of the people, and they have taken the bits in their teeth, and hold on to the English end of the name, which is Duchess, and Duchess it will be, to the end of time.

Among the most valuable pears ever introduced was the Beurre d'Anjou. Good size, fine quality, vigorous, productive, and ripening at a desirable season. Unfortunately, it was handicapped by a French name, unpronounceable by an American tongue. That is the only reason it does not to-day stand abreast with the Bartlett in popular favor. The Bartlett was fortunate enough, in crossing the ocean, to lose its clumsy foreign name, and that fortunate accident enabled our people to ask for it when it was wanted. Anjou don't fit our American tongue, and, notwithstanding all its merits, it is comparatively obscure.

The American Pomological Society, composed, as it is, of men possessed of business common sense, recognizes this absolute necessity of easy names. Even a cucumber is too much cumbered, so the market men say "cuke," unencumbered. They know perfectly well that the busy world will not accept anything else. And if any one brings before this body, a new fruit encumbered with a long name, see how quick Hexamer, and Fuller, and Thomas, and other veterans, will out with their ready axes and decapitate and curtail its superfluous length.

How I wish they could get a good, square whack at the names of our flowers, and ornamental trees and shrubs.

We have a tree here in Florida we call an umbrella tree—seems to me that is long enough. Well, here comes our scientific botanist, and says, to prevent confusion, we must all call it *Melia Azederach umbraculiformis*. Just imagine us pine wood crackers sitting beneath, and conversing, among ourselves, about melia azederach umbraculiformis; can you imagine such a thing?

Another tree that we, here in the pine-woods, are talking about, and whose melodious name is on all our tongues, is the *Acer polymorphus atropurpureus variegatus*.

Those of us who are fortunate enough to live in a country where there are twelve months in a year, have plenty of time to talk about such trees; so when you see us together, lying prone on the wire grass beneath the pine, you hear the soft music of our voices deliberately murmuring *Acer Polymorphus Atropurpureus Variegatus*, seventeen syllables, and not one got away. I know of no organization in the wide world so fit to apply the principles of common sense to the solution of this question as the American Pomological Society. Individuals can do little to relieve the people of this incubus, but a great and powerful organization like this can break the bonds, and open to us all the delights and botanical knowledge now monopolized by the few. In behalf of 120,000,000 English people, I stand here to ask for botany in English, with the text in English, the descriptions in English, and the names in English. We want no double-deck arrangement, with Greek scientific names, for one class, and English common names for another class.

To make us wiser and better, and bring us nearer to the great first cause, I plead earnestly, tearfully, and as forcibly as I can, for English botany for an English-speaking people.

DISCUSSION.

F. L. Temple, Massachusetts: I do not believe that this audience agrees with the sentiments of the speaker. Simple, common names for local use are very convenient, but botanical names, which will be recognized everywhere by scientific men, are necessary.

J. H. White, Florida: While the essay is certainly ingenious, and perhaps ought to

be patented, I can assure the strangers present that there are many old residents in Florida who do not agree with its sentiments. The same objections would lie against every science.

T. W. Moore, Florida : The essay at least shows that there is great need for some one to popularize the science of Botany, but this ought to be done by a scientific botanist.

President Berckmans : The point made in regard to the nomenclature of fruits is a good one, but we should never have been able to do such good work without a scientific knowledge of the species. The scientific name is often a guide in determining what common name to adopt.

THE JAPANESE PERSIMMON

Was the subject of an interesting paper by Mr. B. F. Livingston, of Florida. This fruit he considered as admirably adapted to the soil and climate of Florida, as it grows very rapidly, and bears abundantly, requiring no manure. It does well grafted on the native stock, beginning to bear in five months after being grafted. He has six hundred trees, which attained a height of six to eight feet in one year. No fruit is grown more easily, and the best varieties are very attractive in appearance, and excellent in flavor, being highly relished by most people. He reported some forty or more varieties, as known in Japan ; but of those tested in this country, only four were found worthy of cultivation. Although this fruit has not been found adapted to the Northern States, being unable to withstand the cold of our winters, its success in Florida and California gives promise that it may soon become an important article of commerce, and unless there are unforeseen difficulties in the way of marketing and transportation, we may expect to see its appearance in our northern markets at no distant day.

On the morning of February 21st the report of the Sub-tropical Committee was presented, giving much that was interesting in regard to Southern fruit-growing in the various States. The citrus fruits in all varieties are successfully grown in Florida ; but the orange seems to be regarded as by far the most important, and its culture will doubtless become the great industry of the State. Great care has been taken to bring the fruit to the highest standard, and they now assert, with apparent justice, that their oranges are unsurpassed by those of any other region or country.

The report of the Sub-tropical Committee was very comprehensive, and very interesting from a southern point of view, as it included all, or nearly all, the fruits which are or can be profitably grown in the South. Many of the fruits mentioned were scarcely known by the northern members, and this report was of interest only to them as indicating the source from which our markets may hereafter be supplied with these southern products. Oranges were in greatest variety, there being about 150 varieties claimed ; but it would certainly require an expert to detect the slight shades of difference, if there be any, between some of the varieties. Lemons, figs, bananas, olives, dates, limes, shad-docks (also known as grape-fruit), guavas, with cocoanuts, and pine-apples, are among the most important of the fruits mentioned in reports from the different sections. Some varieties of the strawberry and the grape have also been successful in some parts of Florida ; but most of the strawberries popular at the North have not been found profitable in Florida, not appearing to be suited to their light, sandy soil. A variety called Newman is said to succeed best, but is of indifferent quality.

So far, the orange has been, by far, the most important, as well as the most profitable of the Florida fruits, and they have not only many new varieties of great beauty and excellence, but among them both early and late ripening sorts, which will greatly prolong the orange season, and enable them to supply the northern market until late in the summer. Efforts are also being made by several enthusiastic cultivators to improve the Florida oranges, through crosses and seedlings, and they have established a high standard of excellence which they expect to attain through their efforts. Some of the oranges grown in the region about Ocala, and also from the Indian River section, were of re-

markable excellence; far superior to any which reach our markets from the groves of Europe. For a few years past, no other oranges seem to be wanted in our markets while those of Florida can be had. The Washington Navel orange, the Mandarin, the Tangerine, with some of the so-called Blood oranges, and some improved seedlings are among the most popular, and some of these seem to leave little to be desired or expected in the way of further improvement. A very thin rind, not exceeding one-sixteenth of an inch in thickness; few, or no seeds, fine, high flavor, with no excess of acid, and very little pulp, or "rag," as they now call the fibrous inner portion of the orange, with medium large size, are considered indispensable for strictly first-class oranges, and there were many specimens not wanting in all these requisites.

Two of the most famous orange groves of central Florida, were visited by many of the members. The first was Lipsey's—the "Crescent Company's"—grove. It seemed well cultivated and in fine condition; trees in regular rows, about 20 feet apart, and very symmetrical in shape, averaging from 18 to 20 feet high, and with their glossy, deep green foliage and golden fruit presented a charming sight to northern visitors in February. Some of the trees, from which the crops had been gathered, were just ready to bloom again for the next season's fruitage. Two hundred and fifty thousand boxes of oranges were said to be the product of this grove the present season.

The next grove visited, we were informed, contains 200 acres, and is the largest in Florida. It was interesting, as having been formed mainly from an original wild orange grove, the greater part of the trees having been grafted upon the wild stocks as they stood, and the trees were not generally in rows, but were irregularly dispersed about the grounds, apparently from 12 to 15 and 20 feet apart. This grove belongs to Mr. J. A. Harris; has been twelve years in cultivation, and is still improving and increasing in productiveness each year. The product of the present season was 46,000 boxes, which the owner expects, with a favorable season, will be increased to 60,000 next year. This grove contains some of the finest of the foreign varieties of oranges and lemons; also the shaddock or grape-fruit; but is mainly planted with selections from the best native seedlings of Florida, which the owner considers about as good as any, and although they did not come up to the highest standard, they were certainly very handsome and fine flavored, and found a ready market at paying prices. The value of this grove is estimated at two millions of dollars; but as the net profits, as reported, were only about \$60,000 per annum, about half that amount would probably represent its value more fairly.

All the large groves have very complete arrangements for packing and shipping their products. Large and airy packing and storehouses, and many ingenious devices for rapidly sorting, sizing, and separating the different sizes, so that the boxes may contain fruit of uniform size and appearance, were found in all. The Harris grove has also a small, narrow-gauge tramway, with cars running through it from the railway, which passes on one side. Upon this tramway the members visiting were treated to a ride through the grove to the packing station upon a train with inverted orange boxes for seats, and propelled quite rapidly by mule-power, which was all very nice, except that in places, a good deal of dodging and ducking of heads was necessary to avoid the projecting and overhanging branches of the orange and lemon trees.

Many new groves were noticed in all stages of growth, and in most cases, while waiting for the trees to come into bearing, annual crops of cabbages, tomatoes, potatoes, squashes, turnips, beets, and other vegetables to supply early northern markets, were largely planted. Among the exhibits at the Semi-tropical Exposition, was a collection of sixty of the most distinct named varieties, carefully selected by a Mr. Hart, which were intended for the American exhibit, at the Paris Exposition. Specimens of the Washington Navel orange were on exhibition, of enormous size, 14½ inches in circumference, weighing one and a half pounds, but they were regarded simply as curiosities, medium sizes being considered much more desirable. It was stated that not one-fiftieth part of the trees now planted in Florida are yet in bearing; and while some are already borrowing trouble upon the question of over-production, others are confident that the

demand will keep pace with the supply, and the excellence of their products will always insure a ready market. It is estimated that there are more than one thousand acres of orange groves now planted and growing in Florida, and the area is constantly increasing.

Perhaps the most attractive, as well as the most interesting, feature connected with the meeting of the Society in Florida, was the exhibits of southern fruits and horticultural products, brought together in the semi-tropical exhibition building at Ocala, and where the opening session of the Society was held. For here were displayed, not only the pomological, but the horticultural and agricultural productions of the State, showing at a glance, its principal industries and resources. And, although the soil of the State seemed to be composed largely of sand, especially in the higher portions, and the principal timber the southern, or yellow pine, other portions of what is called "hammock," or "hummock" land, more or less wet, or swampy, seemed rich in humus, or vegetable mould, and when cleared and drained, capable of producing all the southern fruits, as well as vegetables, and grains, in abundance. Samples of a variety of soils from these hammock lands, of various shades of black and brown, and more or less mixed with sand, shells, and clay, all apparently of great fertility, were among the interesting exhibits. The black, brown, and shell-lands are said to produce large crops, and maintain their fertility a long time without manuring, while the sandy, pine lands require the constant aid of fertilizers.

The so-called hammock lands are much the most valuable for orange-groves, and orchards, as well as for all agricultural purposes, but, unfortunately, these regions are more unhealthy, and subject to fevers and diseases, produced by malarial influences. The half-hardy fruits find here a congenial home, and the peaches and plums of China and Japan are reported as being quite successful. The Peen-to peach, and various seedlings from it, were regarded as both the finest in quality, and best adapted to southern cultivation. Kelsey's Japan Plum, which is not hardy, and is also too late in ripening for northern culture, finds a home in Florida. The Satsuma, Ogon, and Boton, and others of that class, are reported as successful and very promising for profitable planting. Varieties suitable for northern latitudes are said not to succeed well in Florida. Curculio was also reported as very destructive on clay soils, but good crops were sometimes raised where pigs and chickens had free access to the trees. Apricots were also successfully grown, budded upon stocks of the wild plum. The Lucretia Dewberry was also reported as remarkably successful, the fruit large, and the best, in every way, of anything of the blackberry family. Some native dewberries were also said to be good. Incidentally, the Erie blackberry was called up, and Mr. E. Williams, of New Jersey, well-known as the introducer of the Kittatinny blackberry, was understood to say the Erie was very much like the old Lawton, or so nearly identical, as to be practically no better.

Peach trees, native plum, and cherry trees were in bloom February 21st; and roses, geraniums, and many annual plants, from open-air culture, were on exhibition, and in bloom, in the Exposition building. Grapes do not appear to have been yet planted extensively in Florida; and there is still room for much information and much experience. The Scuppernong grape seems to thrive and produce abundantly; and in Mr. Harris' orange-grove there is a native vine, of great age, with a main stem fifteen inches in diameter, near the ground. The foreign varieties, *Vitis vinifera*, have been grown with some success, and a paper on the subject, by Baron Van Luttgen, reported quite favorably upon the growth and productiveness of Black Hamburg, and other foreign kinds. This, and a paper on the improvement of our native grapes, by crossing and hybridizing, by the writer, brought out some discussion, and the statement that the Niagara had been grown in central Florida with great success for the past two years, by the use of bone-meal as a fertilizer, using one pound to the vine. The crop was sold in the New York market, about the 15th of June, at 40 cents per pound; and "great expectations" were indulged for the future, as the vines were expected to produce twenty pounds to the plant, the coming season. Reports and opinions were both very conflicting as to the profitable growing of grapes generally; but it will doubtless be found in Florida, as elsewhere, that success will follow intelligent culture, with a proper selection of soil and situation

and the choice of varieties suited to the climate and location. The Ives grape was favorably regarded in some localities, as also the Berckmans, which is claimed to be a cross of Delaware and Clinton.

Among the exhibits that were interesting to northern visitors, were the Bermuda arrow-root, long and pointed, like an Indian arrow, from whence I presume it derives its name. The cassava root, a long, whitish root, as large as one's arm, and sometimes nearly as long, of a white, somewhat starchy character, grows in Florida, and is said to yield 20 tons to the acre. It is also known as manioc, and is probably the variety from which the tapioca of commerce is manufactured. I was told it had value for feeding stock. The melon-fruit, somewhat resembling a long, green, smooth cantaloupe, but which grows upon a small tree, in tropical regions, only beyond the frost-line was said to be relished by the natives; but evidently required a *cultivated* taste, for although it resembled a cantaloupe in appearance, its taste was not agreeable.

An interesting paper and discussion upon the cultivation of pine-apples, brought out the information that, farther south, where frost is unknown, it is not only very successful, but very profitable—and we may expect, at no distant day, to receive large supplies of this delightful fruit from southern Florida. Rev. I. H. White said that the growing of pine-apples, where the soil and situation were favorable, was very profitable, the yield being from \$400 to \$1,200 per acre. Frost is the only enemy they have to contend with, but as it requires two years from planting to perfect the fruit, entire exemption from hard frosts is indispensable. Several varieties are grown, the most valuable being the Sugar-loaf, Egyptian, and Trinidad, the latter being the largest, often weighing five pounds and over. The other varieties are smaller, but finer flavored. They are propagated by slips, or off-shoots, taken from the base of the growing pines, and planted in the fall, in rows, three feet apart, each way, which gives nearly five thousand plants to the acre. A field for pine-growing lasts about seven years, when it is plowed up and allowed to rest one year, when it may be fertilized and planted again. Fig culture, not only in Florida, but in the south generally, was discussed. Reports were varied, and somewhat contradictory, some having been very successful—others failing entirely, under, apparently, the same conditions, and in the same soil and location. The impression was, that further experience was wanting before the growing of figs could be advised for profit.

The cocoanut industry is yet in its infancy, but we can reasonably expect it to prove reliable and profitable when confined to the lower Keys and extreme southern main land.

At Lake Worth are thirteen large trees, whose age is probably not less than thirty years, and which have borne for twenty years. Younger trees are bearing at many points north of this. The freeze of 1886 killed the only fruiting tree on the Manatee river. Along the whole southern coast, young groves of twenty to forty thousand trees are not uncommon. There is a flourishing two-acre grove at Merri's Island, which is without doubt the most northerly one in the United States.

The Banana should be grown where rich soil is abundant, or in those favored spots where fertilizers can be cheaply applied. The plants are adapted to our low, moist lands, and prefer a mulching of palmetto leaves and roots to cultivation. The large plantations are confined to extreme South Florida, where the dwarf sort—*Musca Cavendishii*—is grown. This sort is rather tender, but is the most productive variety grown.

Although the Guava receives less attention than it deserves, it is a fruit of great merit, and can be grown easily, in any situation, wet or dry, rich or poor. Its shipping qualities are about the same as strawberries, perhaps some better, and it can be marketed as well. But its chief use is for making jellies and marmalades, which find a ready sale everywhere.

The Mango industry has been tried comparatively little. The best groves are on Point Pinellas, where they have been successfully cultivated for fourteen years. Two trees at that place, at eight years of age, were at least twenty-five feet in diameter of crown, carrying 19,000 mangos on them at the time. Some fruits were one pound in weight. One grower realized \$219.00 from the sale of fruit from eleven trees, in their

fourth year. Another, \$66.00 from one tree at six years. A shipment was made to various northern cities, and sixty cents per dozen was realized at Chicago, the fruit shipping well. The yellow soil of Florida is most eminently adapted to the mango, and the finest varieties of the East Indies are being planted. These best sorts are destitute of the tough fibre contained in ordinary fruit, and are very superior.

The Sugar-apple is a low-growing tree, bearing in its third year. It is a prolific fruiter, and as the fruit is usually liked very much by those acquainted with it, it can be readily sold. The usual price in the markets of Key West is from twenty-five to forty cents per dozen. There are many Anonas, very similar to the Sugar-apple, and all desirable fruit trees.

The Date Palm is perfectly hardy in nearly all portions of Florida. There are a few bearing trees at Jacksonville, St. Augustine, Tampa, Key West, Manatee, on Key Largo, and Matacombe, and at perhaps a few other places.

At Key Largo there are half a dozen fine young Date Palms, one of which, now eight years old, has borne fruit since its third year.

Orange culture, however, is regarded as the most important—and with the addition and increase of late-ripening kinds it is expected that the season will be prolonged from January until August.

Of very late varieties, Hart's Tardive takes the lead for quality and long-keeping, being in season from March to August, and growing sweeter all the while. It can boast of a distinguished list of synonyms, being known in different places under the names Tardiff, Hart's Late, Fleming's Late, St. Michael, Valencia Late, Brown, and Excelsior.

The Double Imperial Navel, another candidate for public favor, is a seedling lately procured from Mayor Rountree, of New Orleans. It appears to be of moderate size, very solid, fine-grained and heavy; entirely seedless, and of a sprightly vinous flavor. A thorny tree of vigorous growth, and a somewhat different style of blooming from its relative, it encourages the hope of a new departure of value.

A paper from George E. Fairbanks, of Fernandina, Florida, upon "*The Orange Industry in the United States from a Commercial Standpoint*," contains the following interesting statement concerning the present condition and probable future of orange culture: "It is hardly fifteen years since this industry acquired prominence, and all at once, as it were, attracted attention to Florida. Where but a few hundred small groves existed twenty years since, there are now probably over ten thousand. Cotton, corn, sugar, rice, grazing, all require large areas. Orange-growing is one of the most compact and productive of all agricultural industries. One acre of land devoted to the culture of cotton, will produce perhaps fifty dollars' worth of cotton, or twenty dollars' worth of wheat, corn or other grain. A well-established, mature orange grove can be relied upon to produce an orange crop of the value of three hundred dollars to the acre, even at the low price of one dollar per box.

"One railway car will carry the product of twenty-five acres of cotton, but can only carry the product of a single acre of oranges. A grove whose product is 10,000 boxes of oranges, will furnish freight for a train of thirty-three loaded cars. This illustrates the commercial advantage of orange-growing in building and sustaining railways. If we estimate the crop of Florida at present at three million boxes, it requires ten thousand car loads of 300 boxes to the car to move the crop, and calculating the average freight at sixty-six cents per box, the crop pays the railways two millions of dollars for freight alone. The value of the box-stuff used would be \$390,000, the nails \$30,000, the paper for wraps \$120,000, labor in gathering and packing, \$600,000, thus making an output of one million one hundred and forty thousand dollars for simply preparing the fruit for market. If to this large sum we add the cost of cultivation, of fertilizers, of packing houses, teams, tram-roads, and the tools and implements of labor, we can begin to realize the commercial value of this industry, even at this incipient stage of growth. When we realize that not more than one-fiftieth of the orange trees in Florida are bearing, we are

amazed at the possible and probable future development of this industry, peculiar and limited to this single State of Florida, and small areas in Louisiana and California."

Lemons of superior quality, from seedlings of the wild native varieties of Florida are cultivated to some extent, and the prospects for a large and profitable increase in this industry are considered promising. The fruit commands ready sale, and at nearly as good prices as oranges; and the tree is generally considered rather hardier, and less subject to the attacks of insect pests and diseases, than the oranges.

Another fruit of the *Citrus* family, popularly known as grape-fruit, and which is nearly allied to the Shaddock, and resembles it in appearance, being very large, and of a greenish-yellow color, has already found its way to northern markets, and is by some prized above the orange. It is from six to eight inches in diameter, round, orange-shaped, and takes its name probably from its habit of growing in clusters on the trees. It was proposed that the original Indian name, Pomelo, be adopted for this fruit, and at the instance of the Government Pomologist, Mr. H. E. VanDeman, it was understood that this name is hereafter to be recognized by the Society.

Mr. Lyman Phelps said there were several varieties of Pomelo, differing in hardness and seediness. At the last South Florida fair, a very fine, seedless variety was shown, which graded 97.

Mr. E. M. Dubois, of Tallahassee, Florida, gave some of his experience with grapes in Florida, indicating that by judicious selections of varieties and localities, both the native and foreign varieties could be grown successfully, and made profitable for early northern shipments. Delaware, Niagara, and Ives, and several of Rogers' Hybrids, among which Goethe and Lindley were mentioned, had been found valuable for general use; and Cynthiana and Norton were specially adapted to the soil and climate for wine-making.

DISCUSSION OF NEW FRUITS.

Owing to the number of papers presented, only a brief time at the closing session remained for the discussion of new fruits. The citrus fruits were omitted in this discussion, as they had already occupied a large portion of the time of the convention.

APPLES.

YELLOW TRANSPARENT.

Chas. Parry, N. J.: How does it do in the South?

H. E. Van Deman, D. C.: I have received good specimens from southern Illinois, and have reliable information from Missouri and northwestern Arkansas, that it is doing the best there of any of the Russians.

MURPHY.

W. C. Strong, Mass.: It is the most beautiful apple we have, and as good as the Baldwin. It has been exhibited during the last two years as a new apple, under the name Barnes' Stripe. It is a uniform bearer. The variety is an old one, which had nearly gone out of cultivation, but is now coming forward.

F. M. Marble, Mass.: It is nearly as large as the King, and much resembles it in form and color, but is handsomer.

BLACKBERRIES.

Wm. Callahan, Fla.: I have a wild seedling, intermediate between the high and low bush, which I am growing for my own use. I have never eaten a better variety.

LUCRETIA DEWBERRY.

W. C. Steele, Fla.: I have never found any native variety worth cultivating, but I have grown Lucretia to perfection. It produces the largest berry I have ever seen. On moist lands in Florida it is a success. There is a native variety, found at Manatee, by the late P. W. Reasoner, which is said to be equal to Lucretia, and earlier.

President Berckmans: Its habit of growth makes Lucretia of little value.

Geo. W. Campbell, Ohio: Mr. A. J. Caywood, of New York, says that it is best grown trained upon stakes.

H. E. Van Deman, D. C.: I move that Lucretia be added to the Catalogue. [Carried.]

W. C. Strong: I would give it one star for Massachusetts.

Geo. W. Campbell: One star for Ohio.

C. L. Watrous: One star for Iowa.

W. C. Steele: Two stars for Florida on moist land. It should be allowed to run during the growing season, and then trained up on stakes to bear.

MINNEWASKA.

H. E. Van Deman: One of Mr. Caywood's seedlings. I have had specimens from him as fine as any Kittatinny. It is very productive.

F. M. Marble, Mass.: I saw it growing on the grounds of Mr. Caywood. He shipped last year 10,000 boxes to New York.

ERIE.

E. Williams, N. J.: Very nearly identical with the Lawton.

CURRANTS.

CRANDALL.

Geo. W. Trowbridge, Ohio: I am not satisfied with it as a dessert fruit.

G. B. Brackett, Iowa: It is a western variety, originating in Kansas, and but little tried at the East.

E. Y. Teas, Ind.: It is one of the black currants, but less disagreeable in smell and flavor than any other sort. I consider it very valuable for cooking, and fairly good for dessert. It has been considered a hybrid, but that is doubtful.

GOOSEBERRIES.

TRIUMPH.

E. Williams, N. J.: A great improvement over any other variety that will grow in our climate

Geo. W. Trowbridge, Ohio: I have fruited it one year on clay soil, and never before had such fine gooseberries. Its size and quality are all right, but it bears too heavily.

G. B. Brackett, Iowa: We cannot grow it in Iowa.

GRAPES.

LUTIE.

President Berckmans: Originated at Nashville, Tennessee.

J. Van Lindley, N. C.: When I read the unfavorable report made at the last meeting, I had a dozen vines, and thought of pulling them up, but did not. They have now

fruited two years, and I never saw finer vines or fruit. They have had no mildew or rot. At our fair at Raleigh, the past season, they were the equal of any kind on exhibition. They are foxy when first colored, but very fine in flavor when fully ripe. I consider it one of the most valuable grapes we have; it ripens with the Delaware.

H. E. Van Deman, D. C.: I received samples at two different times from Nashville, and they were the worst flavored and smelling grapes I ever tasted. It is a fraud.

Chas. Parry, N. J.: I am fruiting the Lutie, and find it no more foxy or offensive than Dracut Amber, and that is a very profitable grape.

Geo. W. Campbell, Ohio: I made the report at the last meeting, which has been alluded to. It was based on specimens sent me from Nashville, at the same time they were sent to Mr. Van Deman. I suppose that the originators would not send poor specimens; but these were certainly the foxiest and poorest grapes I ever saw in my life. Specimens were sent at the same time, to President Wilder and others. Mr. Wilder wrote me, saying they were so offensive that he had to send them out of the house.

J. S. Newman, Ala.: It was on exhibition at the last meeting of the Georgia State Horticultural Society, where I was chairman of the grape committee. All the members of the committee pronounced it unworthy of cultivation.

JEWEL.

Geo. W. Campbell, Ohio: I have fruited it for three years. It is a small, black grape, of good quality, said by some to equal the Delaware. It has a pleasant flavor, but is more pulpy, and hardly equal to that variety. It is healthier than Delaware—but no stronger grower. The berries are rather larger than Delawares, but the clusters not. Its habit is much like that of Early Victor.

BERCKMANS.

J. S. Newman, Ala.: I fruited it for the first time last year, and find it about equal to the Delaware. It is a vigorous grower.

Samuel Hape, Ga.: Have fruited it several years. The berry is larger, the bunches less compact than Delaware, and the vine more vigorous.

F. M. Hexamer, N. Y.: In New Jersey it is considered equal to the Delaware. The looseness of the bunch is its only objectionable feature.

W. C. Strong: I find it very healthy in Massachusetts.

President Berckmans: It is a cross between Clinton and Delaware, produced by Dr. Wiley, of Charleston, S. C. There is an account of it in the proceedings of this Society for 1871. Dr. Wiley sent me his seedlings from time to time. I selected this one as the best, and he gave it my name.

On motion of Mr. Hape, the variety was added to the Catalogue.

GREEN MOUNTAIN.

J. Manning, Mass.: A very sweet grape, ripening August 20, last year, in Connecticut. It is a strong grower, and resembles the foreign sorts in foliage.

PEACHES.

PEEN-TO.

G. W. Trowbridge: I have grown the Peen-to peach ever since it was introduced, and consider it a great acquisition, especially for the central and northern parts of this State. I move that it be added to the Catalogue, with one star for Florida.

Mr. Trueblood: I know of at least fifteen seedlings of the Peen-to that are better than that variety, so that it seems to me too late now for the Society to put that one on the list. [The motion prevailed.]

PEARS.

IDAHO.

F. M. Hexamer: I consider it one of the most valuable fruits that has been introduced for many years, especially for the North.

President Berckmans: It originated in Idaho. Its quality is of the very best. There are a few trees growing near Mobile, Alabama.

H. E. Van Deman: It is much like Duchess in shape.

PLUMS.

KELSEY.

Mr. Callahan: I have fruited it for two years in Clay county, and am well pleased with it. Have 6,000 trees growing, and expect to set out more. I grow it on native plum stocks. It does not do well on the peach. It is a good grower without fertilizers, makes excellent prunes, and, I think, will ship well.

SATSUMA.

H. E. Van Deman: Equal to Kelsey in size and quality. It is as red as blood inside. A month earlier than Kelsey, and probably more hardy. It may thus prove more valuable for the North, where the Kelsey will not succeed.

The fruit-growers of Florida, however, are not without their troubles and enemies in the way of plant diseases and insects, which attack both their trees and fruits. Scale-insects, which injure the trees and deface the fruit; root-knot, which attacks and injures the roots of the peach, plum, grape, mulberry, orange, and lemon, in a manner apparently similar to the attacks of black-knot, upon the branches of plum and cherry trees at the North, is said to be very injurious, and often destructive. The malady called "die-black," which attacks and kills the end of the branches and gradually destroys the orange-trees; all show that the "sunny South" and "fair Florida," have their compensating afflictions as well as their brethren of the "frozen North." A paper by Secretary E. Williams, of Montclair, N. J., upon "Honesty in Packing Fruits," was well received and applauded. He disapproved the practice of "facing" and covering inferior and worthless fruit, as injurious both to the buyer and seller. Honesty in grading and sorting, as in everything else, was the best policy and paid the best in the end. So far as was observed, however, in all the orange groves and packing-houses, great care was taken in sorting and packing, and the size and the quality of the oranges as put up in the boxes for shipment were remarkable for uniform and honest grading.

Through the courtesy of the railroad companies of Florida, free transportation was offered the members of the Society to any portion of the State, of which some of the members availed themselves to visit the more southern section, where the growing of pine-apples and cocoanuts was practicable. Other short excursions were planned, visiting some of the noted orange groves, and the somewhat celebrated Silver Spring, from which sprang a beautiful and navigable river, whose waters was so clear that the fish and turtles, which were abundant, could be seen from the sides of the little steamer, at a depth of twenty feet or more. During this excursion we had nearly the first sunshine we had seen, and the short run upon the river was greatly enjoyed; the low and marshy borders of the river were lined with immense cypress trees from whose branches swayed in the wind the long, trailing, gray moss, peculiar to southern latitudes. The tall palmettos were also occasionally seen, and in some quarters a thick undergrowth of maples, oaks and other deciduous trees, just breaking into the bloom and beauty of their spring

foliage. Another excursion to an old place called Homosassa, which is to be "boomed" into a newly projected city, brought us near to a beautiful river on the western side of Florida, which flows into the Gulf of Mexico. As we approached the site of the embryo city we saw, from the car windows, long streets cut through the dense undergrowth of swampy or hammock lands, that appeared as though the city must be navigated in these portions by gondolas, and resemble the wonderful Venetian city of the Adriatic. Farther on, however, we found dry land, and the beginning of the future city, among the stately pines; and palmettos, and the wild-orange and other native trees of the almost unbroken forests. A great variety of soils, some apparently of great fertility, and some fine orange groves were seen in this region. An old but quite commodious hotel on the banks of the river, where lunch was served to the excursionists, seemed to be quite a popular winter resort, and implements for hunting deer, hare, and other game, and for fishing and boating, were plenty. The foundations were laid in the neighborhood for a hotel of magnificent proportions. Manufactories and shops were also built, and as the work is understood to be in the hands of a wealthy company, owning many thousands of acres in the vicinity, the city Homosassa may hereafter be one of the notabilities of Florida. Upon inquiry I was told that the *water streets* I had noticed were not intended to be navigable; but, as the land lay some twelve feet above the level of the gulf and river, it was to be drained. After this excursion the members of the Society dispersed, and most of them turned their faces homeward.

The next meeting of the Society will be held in 1891, probably in Chicago.

DROUTH AND ITS LESSONS.

Few of our most skillful horticulturists and farmers, in my opinion, fully realize the importance of shallow and constant cultivation; I mean of keeping the surface of their grounds to the depth of two, three or four inches, so thoroughly pulverized that its consistence is about the same as pure, dry sand, or wood-ashes. When they understand, and ever bear in mind, that the rake in their gardens and the cultivator and harrow in the fields and orchards must be constantly used to break to atoms the crust formed by each rain; that the unremitted, shallow stirring of barely, the surface is the best possible means of preventing a rapid loss of moisture, which, if a drouth occurs, must be supplied from the sub-soil, then they will, each season, as the heat of summer approaches, and while it continues, give the entire surface of their plantations such constant cultivation, as will finely pulverize and mellow its constituent parts, and thereby they will insure great, yea, ample, protection from drouth.

I venture the assertion, that if the sub-soil of any field, orchard or garden in Kansas had been broken up and partially pulverized to the depth of two feet, yes, only eighteen inches, had the surface-soil been mellowed and pulverized each spring, and three inches of the surface kept constantly pulverized by the rake or harrow during the recent protracted drouth, the crops of fruit, grain or vegetables would not have greatly suffered, nor been cut short. This is not theory, nor mere speculation, for the system has been partially tested. A friend of mine, a successful horticulturist of my county, has a young orchard, planted in the spring of 1881, in which he has raised no other crop than apples, during the past two seasons; but he has used the cultivator and harrow diligently, the harrow mainly during the past season, and his trees have not suffered. They made a good, vigorous growth, and yielded a fair crop of fruit for their age. Why? Because the bulk of the soil in which they grew remained moist, while that in more favorably located orchards near by was cracking open and allowing the dry, heated air to penetrate it constantly. (L. A. SIMMONS, in *Kansas State Horticultural Report*.)

· HORTICULTURE IN KANSAS.

One of the wisest things this Society has ever done, has been the collection and publication of the conditions, successes and failures of horticulture *by localities*, a thing which could never have been done except through organized effort. The force of this will be more readily perceived when we take into consideration the fact that we enter this State upon the east at an altitude of seven hundred and forty-five feet above the sea level, and go out of the State at the west at an altitude of about three thousand feet. This difference in altitude necessarily subjects us in the different localities to very different conditions of atmosphere, almost, if not quite, creating different climates; hence, what is successful in the lower altitude, may not, and more likely will not, be successful in the higher, and *vice versa*; in all these things experiments are yet to be completed, and success will surely come to a greater degree by reason of the fact that "we labor and wait."

Until we produce those within our borders and in the different localities best suited, respectively, to our various wants, we must, in planting, avail ourselves of those varieties most generally succeeding in localities similar to our own.

GEO. Y. JOHNSON,
Pres't Kansas State Horticultural Society.

AMERICAN VS. EUROPEAN FORESTRY.

It is not flattering to our pioneers in the West, to read the effusions of new converts published in our Eastern papers, when noting a simple experiment in Europe, to be told that when we have had a hundred years of experience in this country, we will begin to know what they do now. We have reports of all they are doing in Europe, and can bring it into practice in this country, as far as our climate and condition will permit. But the most interesting and most difficult problems must be worked out *here*, just as they have been with agriculture and horticulture, in this country. Much less than one hundred years ago, our people were conducting agriculture on the European plan, with their cast-iron plows and sickles and reaping-hooks. Now we have our mowers and reapers and headers and twine-binders. Less than one hundred years ago, our National Pomological Association (of which most of us are members) was deciding the best and most profitable varieties of fruits for cultivation in this country. We soon found that there was not a single variety profitable in all parts of the country, not even in the same latitude, and we soon found that we must recommend each variety for a locality only. Varieties that would prove to be the most hardy and the best bearers in the East, would prove to be, in most cases, in the same latitude in the West, so tender that they would winter-kill, or, if hardy, the tree would prove to be a shy bearer, and in many cases the fruit, almost worthless. ROBERT DOUGLASS, in *Kansas State Report.*)

The Illinois State Horticultural Society, has issued its thirty-third annual report, by the Secretary, A. C. Hammond, of Warsaw. We extract from its pages the following interesting matter, which will doubtless have value for the fruit-growers of Ohio:

APPROVED LISTS.

The following lists of apples are recommended for planting in the three Horticultural Districts of the State:

28 A. Appendix

FOR SOUTHERN ILLINOIS.

Early Summer—Benoni, Red June, Early Harvest.

Late Summer—Chenango Strawberry, Lowell, Maiden's Blush.

Fall—Jonathan, Mother, Grimes' Golden.

Winter—Ben Davis, Winesap, Minkler, Rome Beauty.

Recommended for trial—Yellow Transparent, Fink, Niel's Keeper, Pickett, Crain's Spice, Indian, Black Twig.

FOR CENTRAL ILLINOIS.

Summer—Red Astrachan, Benoni, Duchess.

Fall—Maiden's Blush, Wealthy, Ramsdell's Sweet.

Early Winter—Jonathan, Grimes' Golden.

Late Winter—Ben Davis, Willow, Minkler.

FOR NORTHERN ILLINOIS.

Summer—Benoni, Duchess.

Fall—Maiden's Blush, Cayuga Red Streak, Fameuse, Wealthy.

Winter—Jonathan, Ben Davis, Willow, Roman Stem, Minkler.

The following list of pears is recommended for general planting :

Pears—Tyson, Seckel, Keiffer, Flemish Beauty, Howell.

The following list of vegetables, for the farmer's garden, was recommended by the Society, at the last annual meeting :

Asparagus, Radishes, Lettuce, Peas, Beets, Onions, Salsify, Cabbage, Tomatoes, Bush Beans, Sweet-Corn, Lima-Beans, Cucumbers, Melons, Rhubarb, Horse-Radish.

The following lists of trees and shrubs are recommended as suitable for the purposes named :

FOR LAWNS.

Trees—Elm, Hard Maple, Magnolia Acuminata, Linden, Tulip Tree, Catalpa Speciosa, Birch, Mountain Ash, Norway Spruce, White Pine.

Shrubs—Syringa Philadelphus, Snow Ball, Upright Honeysuckle, Strawberry Tree, Fringe Tree, Purple-Leaved Berberry, Lilac, Flowering Almond, Spirea Van-Houttii, Flowering Quince, Hydrangea-Paniculata-Grandiflora, Calycanthus.

Climbers—American Ivy, Scarlet Honeysuckle, Fragrant Honeysuckle, Clematis Jackmanii, Wisteria.

FOR SCHOOL YARDS.

Elm, Ash, Hard Maple, Catalpa Speciosa, Linden.

FOR THE ROAD-SIDE.

Elm, Linden, Hard Maple, Ash, Catalpa Speciosa.

REPORTS ON ORCHARDS.

* * * The Ben Davis has turned its face to the setting sun, and seems to feel the chill of old age coming on. The people, to a certain extent, seem to realize this, but the

pertinent question with every-one is, if not the Ben Davis, what shall we set? Plant Ben Davis, but not to the exclusion of other varieties, nor in solid blocks, by themselves, for reasons given further on. Mix in Minkler, Winesap, Rome Beauty, or any variety that experience or location may suggest.

Mr. Caldwell says, for Central Illinois, he would set Ben Davis, Willow Twig, and Rome Beauty, entirely.

In 1861, we planted one thousand apple-trees, as follows: Commencing on the east side of forty acres, running clear across, north and south, first, 200 Little Romanites; second, 200 Wine Saps; third, 300 Janets; fourth, 100 Ortleys; fifth, 100 Kings; sixth, 100 Tallman Sweets.

In 1863, we set 500 Ben Davis. Forty of the Little Romanites had died, and a few of the others. A survey of the land, showed room enough for a row on the south end. After planting that row, and filling in where the others had died, we set the balance, eight rows deep, on the west side. Our experience has been, that the end row, and those used to fill in, bore more, and finer fruit, than the average in the solid block.

We did not suspect the cause then, nor do we know it now, as a positive fact, but our belief is about as eight is to seven (which, for all practical purposes, on a certain noted occasion, was considered very near a certainty) that cross-fertilization did it.

We have ten acres, set entire with Ben Davis, eleven years old. It never has borne a full crop of perfect apples.

Henry Ray planted, in 1865, six acres, about two-thirds Ben Davis, on the north, the balance on the south, consisting of Winesaps, Janets, and Rhenish Mays. It produced several fine crops. In 1871 he set several acres, adjoining on the east side, solid Ben Davis. That orchard never has borne a satisfactory crop, and is now on the decline.

What avails thoughtful selection of site, and careful cultivation, if our trees are rendered constitutionally weak and short-lived, not by a survival of the fittest, but by a long line of selecting seed, for raising stocks to graft on from the poorest fruit, if seed for stock is mainly procured from cider-presses? May we not confidently look in that direction for the cause of lost vitality? * * * *

If our trees are to be saved from slow, but sure, destruction, those that are interested must keep the words ringing in the ears of people, that obtaining seed from imperfect fruit to build our orchards on, will have its effect, as certainly as conditions favoring consumption are transmitted from sire to son.—ALLEN COPE, of Tonti, Ill.

INFLUENCE OF STOCK AND CROSS-FERTILIZATION.

The element of vitality seems to depend largely on the proper observance of Nature's laws in re-production. I consider one of the most important of these is, that there be a variation in the tendencies of the pollen and ovule. To get this variation, it is better to use pollen from another individual than the one that furnished the ovule. As the development of the fruit—the receptacle, or ovary—depends upon the fertilization of the ovule, the vitality of the receptacle, or ovary, seems to depend upon this vitality of the ovule; and hence fruit containing developing ovules of strong vitality, can resist attacks of enemies better than fruit with a weak ovule. Then, if we can learn to govern this influence of the pollen, through the science of breeding, or the laws in reproduction, we will have enlarged our capacity in the production of fruits of high quality. The seeds of fruit must be fertilized, or the fruit will not develop. Apples having seeds not fertilized, drop when they have reached a certain stage of development. If they have to be fertilized at all, will not a fertilization in accordance with known laws prove more beneficial than an accidental fertilization? Does it not give increased vigor and stronger development?

For several years, I have noticed our best apples, of several varieties, were from trees where the varieties grew contiguous. Among these were English Golden Russet, and Roman Stem, that stood with limbs interlocking, between parallel rows. The finest

specimens of these varieties, were taken from these limbs, and many of them showed a tendency to approach the other variety in characteristics. Not but what Roman Stems were taken from Roman Stem trees, and Russets from Russet trees, but there was a slight tendency in each one, to approach the other, enough to excite the question whether this mixing of blood was not responsible for the better appearance of the fruit, and the greater apparent resistance to its enemies. On trees of Maiden's Blush, and Fameuse, standing near together, we have, for several seasons, obtained better fruit, than from the same varieties, standing by themselves, though I have been unable to detect any difference in the appearance, or thriftiness of the trees, to which it might be due.

If there is this influence on the fruit, due to cross-fertilization, we can use it in the orchard, to remedy much of the inferior quality of fruit, by planting the trees so as to give the greatest opportunity to the foreign pollen. Instead of setting trees of each variety together, mix, as far as possible, with other varieties, with somewhat similar characteristics.—F. I. MANN, of Gilman, Ill.

Col. Brackett, of Iowa: This question, of stock and scion, is an old one. As a rule, we should select the best seed for planting, but it is well to bear in mind, that when we graft, we change the whole structure. Take a lot of seed from a cider-mill, and graft the young seedlings with Duchess, and they will be alike hardy, but plant seed of the Duchess, and graft with a tender variety, and the trees will all be alike tender. Hence, we see, that if the scion is hardy, the root has little or no effect.

Mr. Minkler: We expect too much of our orchards. We seed them to blue-grass, and make a pasture of them, and expect them to produce fruit. Examine the ground, after a rain, and you will find that it is wet but an inch or two; but go to the cultivated field, and it is wet deeply. Don't plant too many varieties; don't plant Russians, but plant intelligently, and cultivate carefully, and you will grow as good fruit as you did twenty years ago.

FROM REPORT FOR NORTHERN ILLINOIS.

BY ARTHUR BRYANT.

The apple-crops have been the largest for many years, and the fruit is very much sounder than usual, on account of the codling-moth not being so plentiful as formerly.

The blight of certain varieties, has damaged the orchard trees, in some localities, to a considerable extent, but still, not as seriously as in former years. In this district, the nursery trees have not been much affected by it. In our orchards, the Willow, and some of the crabs, seem to have suffered the most.

My observations would not lead me to consider that high cultivation is likely to increase the liability of the apple to blight. Some of the worst cases of blight, which have come to my notice, have occurred on land of ordinary fertility, that had never been highly manured, or fertilized in any way.

The cold weather, early in the season, and the killing of the first bloom, by late frosts, made the first picking of strawberries unusually late.

These frosts, and the continued dry weather, while ripening, made the crop, in our vicinity, light, and the later pickings small. However, the general supply seemed to be ample, and berries of good quality were plentiful.

Of the varieties that are planted, I think the Crescent still predominates, and where well fertilized, gives entire satisfaction. The lack of fertilization is one of the great causes of failure with many of the pistillate varieties of strawberries. Captain Jack and May King are used by many as fertilizers.

One experienced planter said that in planting fourteen acres for profit, he would plant ten acres of Crescent, fertilized with May King, and four acres of Windsor Chief, fertilized with Capt. Jack.

On old plantations, Bubach No. 5 has done finely, but the new, or last year's setting, did not seem to fruit so well. Whether this was due to frosts or dry weather, I am not decided.

Warfield's No. 2, Jessie, and several other varieties were planted, but the experience this season will not warrant any expression of opinion, further than that the growth of the two varieties named, was very satisfactory.

Raspberfies, where the plantations were not too old and weakened, in some cases were a fair crop. From present indications I think that the plantations of raspberries will necessarily have to be renewed quite frequently, on account of the effect of insect enemies, and summer drouths. In small plots, heavy mulching is practicable, and I think it would lengthen the life of the plants, and increase the quantity and quality of the fruit.

The Gregg and Souhegan are mostly planted, but the Ohio is gaining favor with those who have tested it. Shaffer's Colossal, when it winters well, is colossal in size, growth and bearing. Mine were seriously injured last winter, though from what cause, I have not fully determined, as the wood seemed fairly well ripened in the fall. This is one of the most profitable raspberries, with me, for notwithstanding the injury to the bushes, we received fully as much fruit to the acre from them as from any other variety.

The Snyder Blackberry is the only variety planted to any extent. Young plantations had good crops, but old ones suffered from weakness in the canes and dry weather.

This year, grapes were all very late in ripening, and the later varieties were not well matured, and lacked in flavor.

FROM REPORT ON GRAPES, BY GEO. B. WORTHEN, WARSAW, ILLS.

I have but little to report on grapes, and that little, not very encouraging. In this locality, the crop in all the large vineyards has been a failure on account of the rot. There was never a finer prospect for a crop than last spring, but by the first of July, nearly everything that was not rot-proof, was gone.

The largest vineyard in the county is owned by Broult Bros., of Warsaw, who have thirty acres of Concords. Their crop was one-half barrel of wine. I have ten acres of Concords, and I did not pick any of them. There are a few Catawba vines in the county, but they rotted as badly as the Concords. As a general thing, the grapes in the city lots where there were but a few vines, and those not cultivated, did not rot.

Of the older, the Virginia Seedling and the Hermann are the most reliable, but they must be protected in winter. I protect by pruning in the fall and laying the canes on the ground, and putting enough earth on them to hold them down.

Of the newer varieties I have fruited, the Etta is the most promising. It has not the fault of its parent, the Elvira, of bursting when it ripens. I set out three vines in 1886, and this season picked sixty-six pounds from them. The largest bunches weighing seven ounces, and every berry perfect.

All of Rogers' Hybrids I have tried have been a failure with me, as well as Lady, Lady Washington, Missouri Riesling, Vergennes, El Dorado, Cleverer, Black Pearl. Empire State, Bacchus, Peter Wylie, Oriental, Waverly and Jefferson. I have one Worden planted in the old Concord vineyard, that rotted as badly as the Concords, while one in my experimental vineyard—probably twenty rods away from the Concords—had perfect fruit; the former was seven years old, the latter three years.

I have tried bagging on a small scale, and it is a success, if done early enough, but it must be done as soon after blossoming as possible, and even then, you will sometimes find a bunch entirely rotted.

SPRAYING FRUIT TREES.

Mr. A. C. Hammond, of Warsaw, Illinois, says: Last season the apple crop was so light that nearly every specimen, where no efforts were made to destroy them, contained

one or more worms; but, where the trees were carefully sprayed, a very small per cent. contained a larva. The experiments therefore made at that time were very conclusive, and showed that a large per cent. of our apples can be saved, even in an unfavorable year.

Now, when the moth has been reduced by natural causes, is the time for orchardists to spray their trees, for if this is done annually, they can be so kept in check, that we can grow sound, perfect fruit, instead of finding a disgusting worm in every specimen.

In speaking of this question a year ago, I said I was quite positive the poisonous application diminished the curculio in my orchard, and the result of this year's experiment confirms me in the opinion that it can be in a great measure controlled, and that most-dreaded of all orchard insects, the canker-worm, can be kept within safe bounds, if not entirely exterminated.

Mr. I. R. Duglass gives his experience, as follows: I ordered a Field's Improved Force Pump, manufactured by The Field Force Pump Company, of Lockport, N. Y.—cost, fourteen dollars. The suction pipe of this pump passes down through a hole in the head of the barrel, the pipe reaching nearly to the bottom, the pump being held in position on the head of the barrel by screwing it fast to the head.

We sprayed about 2,000 of our trees, and are well pleased with the result—the fruit on the sprayed trees being very much smoother than that on the unsprayed, and almost entirely free from worms.

The best comparison, I got from two separate blocks of Willow Twig trees that stand about two hundred yards apart—both blocks the same age, being ten years old last spring. From the sprayed block of trees, eighty-five in number, we gathered ninety-three barrels of the largest and smoothest Willow Twigs that I ever saw, and I do not believe that there were eight barrels of waste apples, or culls, left on the ground from the whole block of eighty-five trees; while from the other, or unsprayed block of seventy-five trees, we got only thirteen barrels, leaving the ground literally paved with wormy and specked apples.

I am so thoroughly convinced of the immense benefits resulting from spraying, that I shall use it more largely next spring.

As to the time for spraying, I would begin as soon as the trees are in full bloom, and continue the work as long as the apple stands erect on the stem. I think it would be dangerous to use the spray after the apple gets heavy enough to hang downward from the stem, as then the poison would lodge in the cavity around the stem and remain there, in spite of the washing of subsequent rainfalls.

London Purple not only destroys the progeny of the codling-moth, but it seems to be a death-dealing agent to all insects that prey upon the fruit and foliage of the apple-tree. In one portion of my orchard last spring, the measuring worms were getting quite numerous, and were rapidly stripping the trees of their leaves. We gave them a dose of London Purple, and two days afterward a live worm could hardly be found in that part of the orchard; but there were plenty of dead ones swinging by their webs from the leaves that were left on the trees. So, taking it all in all, I think that we have in London Purple, rightly applied, a safe and efficient remedy against most of the fruit and leaf-eating insect enemies of the orchardist.

FROM REPORT ON NEW FRUITS.

BY I. WEBSTER, CENTRALIA, ILLS.

Strawberries.—Of recent introductions, fruited the second time, Bubach does not meet our expectation in our end of the State. A large berry of medium quality, very soft, poor shipper. Plants do not stand our midsummer sun; the yield is light when compared with the kinds we grow. The same may be said of the Jessie, except that it is a more vigorous grower and plant-maker, in our soil, than the former.

Warfield No. 2, holds its position as the best market strawberry in Southern Illinois, old or new, of good average size all through the season, firm shipper, of good quality and fine appearance in box.

Raspberries.—Of recent introductions we have nothing to report. Red Cuthbert and Brandywine are considered the best with us. Of black-caps, Tyler, Souhegan, Ohio Black, and Gregg. Shaeffer's Colossal takes the lead as a very large berry, for home use and home market, but is a very poor shipper.

Gooseberries.—The Downing, Mountain Seedling, and Houghton are grown, and for market in order named. Triumph, a new American gooseberry, from Pennsylvania, is a promising rival of the Downing, much larger. This year, they bore a nice crop of large, handsome berries, free from mildew. The Industry has, with us, not proved profitable; like all English varieties, it has fallen a victim to mildew.

Grapes.—Niagara has proven hardy, and bids fair to be a rival of Concord; it was not entirely free from rot this year. We only know of three kinds that are, viz.: Perkins, Norton's Virginia Seedling, and Cynthiana. Empire State has been fruited by some amateurs, and is highly esteemed. Brighton, Noah, Lindley and Worden are successfully grown in Clinton county, by a few Germans, who bag them early.

Blackberries.—Early Harvest stands first as an early berry, ripening before the Black Raspberries are done; of medium size and of fair quality. Western Triumph and Stone's Hardy, fruited by us two years. We like them better than Snyder, for this far south. We can see no difference in the Erie and Lawton, after one year's fruiting.

Currants.—The Victoria and Red Dutch take the lead here as red currants. The Fays, like the Cherry, will never be profitably grown this far south; with us being almost the southern limit of currant growing.

Pears.—Keiffer and LeConte produced heavy crops this year, on four and five-year-old trees. The LeConte is an enormous bearer; quality third rate. Jefferson and Early Harvest are one and same pear to me; early, and of third quality.

Quinces.—Meech's Prolific is a vigorous, good grower. Tree hardier than Reas' Mammoth or Orange quince; bore fruit this year very similar in size and quality to the Orange quince.

Plums.—We fruited several new American kinds—the De Caraduc, a very fine, large round plum, pretty as a Nectarine, dark mottled and marbled, small round stone, quality good; ripens July 20. Golden Beauty, ripens September 1 to 10. It is an enormous bearer, fruit actually hiding foliage; beautiful, golden yellow, clear skin, of good medium size and quality.

Cherries.—The Montmorency takes the lead for a valuable cherry of the Morello class, for the last few weeks of June, either for a home or market cherry.

Apples.—We fruited Grand Sultan and Tetofsky again, this year. The Grand Sultan is an enormous bearer; ripens July 15; of medium to large size, beautiful clear skin, almost white, very smooth and handsome, very much like Yellow Transparent in size and quality. Black Twig, from Tennessee, promises to be good for Southern Illinois. We have, in the south end of the State, a number of apples, not generally known, that bid fair to be successful rivals of some of the older varieties. Among them may be named Johnson County Red, Red Winter Pippin, Sparks, Terril, Picket, Ingram, Shackelford, York Imperial.

Peaches.—Of new varieties coming under my own observation, the Thurber is hardy, very large, free-stone of fine appearance; a No. 1 market peach. Elberta, a large oblong peach, with a rich, yellowish cast of skin, blush on sunny side, of good quality; a very fine, valuable market peach. The Ede originated with Captain Ede, of Cobden, Illinois; large free-stone, of delicious quality, a valuable August market peach; this is one of the most delicious peaches I have ever tasted. Freeman's Late originated with H. C. Freeman, of Alto Pass; is a fine, valuable market peach, for last week in August; a good shipper, of the Smock type, but by no means a Smock; it is of fine appearance and quality, and very satisfactory.

RASPBERRIES AND BLACKBERRIES IN ILLINOIS.

Raspberries.—The varieties of raspberries for profitable marketing can be counted on the fingers of one hand. For early, Tyler and Souhegan, and Ohio for late, and, in well-sheltered locations, I might add Gregg. There is but little difference between the Tyler and Souhegan; if any, it is in favor of the Tyler. The Ohio is a very strong grower and very hardy; fruit not so large as Gregg, but of better quality. The Turner and Cuthbert are the leading red varieties. The Shaeffer's Colossal is growing in favor with the consumer. When the Shaeffer was first put upon the market, it was nearly impossible to sell it, on account of its color; since people have become acquainted with it, there is quite a demand for it. It is a splendid berry to can.

Blackberries.—I have fruited five varieties of blackberries this season: Snyder, Stone's Hardy, Barnard, Taylor and Agawam. They stand in value in the order named. The Snyder and Stone's Hardy are more hardy than the others. In quality, some prefer Barnard and Taylor, but for profit, Snyder and Stone's Hardy head the list. In the northern half of our State, there are one hundred acres of Snyders grown, for every acre of all other varieties.—H. VICKROY, *Normal, Illinois.*

THE COMING APPLE-TREE FOR NORTHERN ILLINOIS.

BY J. V. COTTA, NURSERY, ILLINOIS.

The advent of the Russian type into this country is of comparatively recent date. It was first imported, in quantity, eighteen years ago, since which time, frequent importations have been made, so the entire number of varieties on trial at present amounts to about 500. Much has been expected from these foreign sorts—as yet, comparatively little has been realized.

As to the propagation of the apple-tree, there are several modes practiced, and, as might be expected, the advocates of each of these, claim superiority for their preferences. Unfortunately, some of these have been run into a sort of "hobbies" by tree-peddlers, and are used as baits for catching "suckers." The general practice has been that of root-grafting, on sections of the root, by making about two four-inch cuts, from a first-class seedling of one year's growth, the scion being cut the same length. If our trees could be depended upon for hardiness, this mode of propagation would be entirely satisfactory; as it is, it does not produce a reliable, long-lived tree of our old sorts.

Another idea is the use of a short root, two inches only, and a long, six-inch scion. For this, it is claimed that the scion will emit roots itself, which places the tree practically on its own roots, and increases its hardiness. As to plausibility, this idea seems correct enough, but practically considered, it does not hold good to any great extent. When the arctic waves of our recent test winters struck trees thus propagated, if of tender or half-hardy sorts, they made a "clean sweep of them all," notwithstanding our northern friends had laid great stress upon the value of a short root.

Two other hobbies have, of recent years, gone the rounds, and many thousands of dollars have been squeezed out of northern planters by interested peddlers "harping" upon the great hardiness and value of budded trees, and on trees grafted on whole roots. Does the public not know that, in spite of the extravagant claims made, many thousands of trees sold as budded, at exorbitant prices, by those amiable fellows, are simply common root-grafted ones, cut off at the ground, at one year old, and started anew, which process makes them look for all the world like budded trees?

Let me tell you what I know about trees grafted on whole roots. You remember the introduction of the famous Mann apple some seven or eight years ago. It was claimed to be the coming apple—just what we westerners had been looking for, lo, these many years. As hardy as the Duchess, an enormous bearer of large, delicious fruit, and the best and latest keeper in existence; then last, but not least, the trees all grafted on whole

roots. I invested, the trees arrived direct from headquarters, and such roots—long, slender tap roots, a few of them forked, but not a single one of them supplied with brace roots to anchor or hold the tree firmly in place, and as a result of such malformation the trees continually swayed about by the wind. I should have staked them, but didn't; we don't want to stake our trees here; if they cannot stand up alone they may lie down to it. Well, I repeatedly banked them up and firmed them as well as I could, and they all made a fair growth the first season. The following spring, one-half of them did not leave out; and the second spring I found that the balance had "given up the ghost." Now if you will invest in that class of trees you may reasonably expect to be quite as successful.

We have so far looked mainly upon the shady side of the picture, but as the darkest hour is just before daylight, we can already discern glimpses of the dawning of a brighter day. If you will turn to the transactions of the Iowa State Horticultural Society for 1879, you will there find the report of an investigation of the orchard of Drury Overton, near Knoxville. This orchard contained about 2,000 trees, and was divided between root and top-grafted trees, the latter on such hardy stocks as were then available. In every instance, the top-worked trees had been far superior in all respects to root-grafted trees of the same varieties; one William's Favorite, top-worked bearing as much fruit as five root-grafted trees of the same kind and age. In 1856 to '57, one hundred root-grafted Rambos were winter-killed, while two top-worked trees of the same kind and planted the same time escaped and were in 1879 still sound and vigorous, bearing plentifully. If you will take the trouble to visit J. C. Plumb, at Milton, Wis., he will show you a top-worked tree of Ben Davis, on a cherry crab stock; this tree is in excellent condition, bearing fine annual crops, as if no severe winter had ever existed. Not a single root-grafted Ben Davis orchard tree is alive in all Wisconsin, outside of the Lake belt, and even as far south as Champaign, Ill., root-grafted trees of this variety have nearly all been killed. There are also quite a number of top-worked Ben Davis orchard trees in Champaign, Ogle, and Stephenson counties, all of which have escaped our recent test winters, and are in prime condition and very productive.

During the recent test winters I lost by winter-killing not less than 40,000 root-grafted nursery trees; while standing in the same blocks, under the same general treatment and of the same varieties, I had several thousand top-grafted trees by way of experiment, and of these I did not lose a tree. Gentlemen, these things have made me very radical in my views. I would no more think of planting sweet cherries or peaches as a commercial venture in Northern Illinois, than to plant root-grafted or budded trees of any variety of apples less hardy than the Duchess.

That failures have occurred with top-grafted trees, cannot be denied, but these can invariably be traced back either to a want of hardiness in the stock used, or to a want of affinity between stock and scion, or to the use of stocks of too large a size, or to mismanagement in the process of growing the tree, or to some other valid cause, and not to the principle involved. It is claimed by some, that top-working, to be successful, must be done in the branches. Well, if any amateur or orchardist desires to do his own grafting, I have not the slightest objection; but if this work is to be done in nurseries, where it ought to be done in order to benefit the public at large, branch-grafting is entirely out of the question on account of its great expense, and the setting of one scion—standard-high—upon the stem of the "iron-clad" stock-tree answers every purpose, just as well as the setting of a dozen scions into the branches.

The selection of suitable varieties to be used as stock-trees for double or top-working is of prime importance, and the following characteristics should be rigidly kept in view, to-wit: perfect hardiness under all existing climatic conditions, congeniality to the scion, sound foliage, not subject to mildew and rust, a free, upright, vigorous habit, early maturity of the young growth, and persistency of rest during warm weather in winter, and until the opening of spring. With the trunks of our trees thus constructed, we need have no fears of the result. The varieties found to best combine these desirable traits, as far as tested for this purpose, are Whitney's No. 20, Milton, Virginia, Shields,

and several others of the Siberian type, and Duchess, Arabian, Charlamoff, Green Streaked, Silken Leaf, Hibernial, and other free-growing iron-clads among the Russians.

Top-worked upon such stocks, and with rational after-treatment of trees in orchards, we can have healthy, long-lived trees, bearing an abundance of the finest and best apples in the world from such varieties as Yellow Transparent, Trenton Early, Bailey Sweet, Garfield, Fameuse, St. Lawrence, Shiawassee Beauty, Maiden's Blush, Plumb's Cider, Miller's Red, Wolf River, Wealthy, Roman Stem, Twenty-Ounce, Jonathan, Golden Russet, Grimes' Golden, Tallman Sweet, Ben Davis, Wythe, North-western Greening, Hay's Winter Wine, Willow Twig, and others, and if we add the Duchess and a few of the most desirable of the newer Russians, which may successfully be grown by common root-grafting, we have an assortment more than ample for all practical needs of the people of Northern Illinois.

DISCUSSION.

Mr. Minkler: This apple question is a large one, and one that interests us all. My advice is to go slow on Russian apples. Beware gentlemen; it is not cold alone that kills our apple-trees. We have plenty of hardy varieties suitable for top-working, that are tested and not experiments. There are no better varieties than the Whitney No. 20, and the Duchess. The most abused thing on the farm, is the apple-orchard.

Mr. J. V. Cotta: The farmers are not the only ones who abuse their orchards. I refer to an orchard that was owned by a Michigan college I know of, which had become matted with blue grass, the trees diseased and in very bad condition. A new professor came in charge of that department and concluded to try to put the orchard in shape, if it were possible to do so. He commenced by first giving the ground a thorough plowing, then he pruned the trees up, and destroyed the insects that were preying upon them, as far as possible taking precautions to prevent their further depredations, putting the orchard in first-class condition. The result was, his efforts were rewarded, though the trees did not show much improvement the first year, still looking sickly. The second spring after he commenced operations, the trees came out in full leaf, vigorous and healthy, blooming full, and the orchard bore some eighteen hundred bushels of apples. This example shows conclusively what results can be obtained when an orchard is properly cared for and looked after.

Mr. S. G. Minkler: If trees have vitality, they will bear and pay, but how can any one expect to raise apples if the trees are not properly fed and cared for. Right after a heavy rain I have examined the ground in an orchard which was seeded down to blue grass, and found the water had not wet down at all, to do the trees a particle of good. We cannot dry nor starve our orchard trees to death, and then expect to get apples from them. Prune your trees and look after the renewing of your ground. It will pay you for your trouble. The first decline in our orchards dates back to 1878, when we had a warm February and very cold March, which damaged the trees more or less.

Mr. L. Woodard: I concur in Mr. Minkler's remarks, and would recommend, as a remedy to prevent an orchard from dying out, to mulch it with straw and leave it on; it will assist in renewing the land and keep it moist.

Mr. A. R. Whitney: I have been in the habit of hauling the manure from my place on to my orchard ground and find it of great benefit; consider straw mulch a good thing also, have tried it as an experiment, putting it around some trees and leaving the ground bare under others. The result was, I got a good crop of apples where trees were mulched, and none where they were not.

Mr. W. W. Wicks: Protect your trees from sun-scald and rabbits. Paper wrapped around the bodies will answer. A good wash for nursery trees is night soil and sulphur.

Mr. A. R. Whitney: I wash my trees with a solution composed of one-half bushel of stone lime, one pound of glue, and one pound of copperas. This quantity will wash 200 orchard trees, and will keep off the rabbits and insects.

WHAT APPLES TO PLANT, HOW TO PICK, AND HOW TO MAKE APPLE-BUTTER.

Thos. Gregg: My own orchard, with many others, is decaying. We must replant or plant anew. What shall we plant for family use? Say three varieties each of apples—summer, fall and winter.

Mr. Leeper named Red Astrachan, Summer Pearmain, Early Harvest, Maiden's Blush, Rambo, Milam, Ben Davis, Willow and Jonathan.

A. C. Hammond gave Duchess, Red Astrachan, Sops of Wine, Wealthy, Maiden's Blush, Porter, Ben Davis, Willow and Jonathan.

J. T. Johnson: Substitute Benoni for Porter and Grimes' Golden for Willow, and I like the list better.

Questions by H. D. Brown: Do you advise picking Winesap and Ben Davis first week in October for winter keeping? Do you put winter apples in cellar immediately after picking?

T. F. Leeper: Never pick before October for winter keeping; do not put apples in cellar, and especially in bulk, until later. If bulked too early, they heat. If left outside after picking, you must protect from the weather, especially rain. Apples keep best if not bulked—that is, you can keep most successfully in boxes or packages.

Mr. Hammond: The sooner you pick, after they are ripe, the better they will keep. My early pickings keep longest. They do keep well in boxes, but too much air, or too much light, is injurious.

J. H. Emerson said a word in praise of the local apple, the Montebello. I planted them twelve years ago; the tree is a good grower, is upright and handsome; the fruit clusters all along its branches; they are fine in appearance, best in quality, and profuse in bearing. They begin to ripen with September, but their season runs into early winter. Every family should have the Montebello.

Question by President Gray: As to the best mode of making apple-butter?

Mrs. Hammond: I use cider boiled to one-fourth; use good apples, well stewed and carefully rubbed through a sieve, freeing the fruit from seeds, cores, etc.; add sugar to suit the taste. Constant care is required in the cooking.

C. C. Hoppe: I use a few lemons, and not quite so much cider, and to keep, put in earthen or stone jars, and cover with cloths wet in salicylic acid; over this I place cotton batting; it will keep it perfectly.

J. C. Berry: Put your kettle flat on the ground when you cook apple-butter. The fire should never touch the bottom, but heat only the side of the kettle. You will not only obviate burning or scorching of fruit, but will actually cook three times faster than the old way. Try it.

IOWA STATE HORTICULTURAL SOCIETY.

The following extracts are from the twenty-third volume of the transactions, issued by its Secretary, Geo. Van Houten, of Lenox, Iowa:

TREE PRUNING.

We cannot always shape our trees as we would like to have them in the nursery, and the orchardist should go over his trees at least once a year and remove such limbs as should not remain. As to time of pruning some contend that the pruning should be done when the trees are in leaf. But at that time the orchardist cannot see so well what limbs should be removed. When no leaves are on the trees, the pruner can see better what limbs should be removed, and the pruning can be done at a time of year when he has more time to devote to the work. Apple-trees have a peculiar tenacity of life, and every limb wants to become a leader. It should be the object of the orchardist to control and direct the growth of his trees, and to do this properly, he should give them some care and attention each year.—CHAS. PATTERSON, Iowa.

SMALL FRUITS IN IOWA.

Strawberries.—Jessie is vigorous, but not so much as the Bubach, nor is it so prolific or so large, though the quality, when fully ripe, is superb.

Warfield No. 2 is another that is fully as vigorous as the Crescent; fruit large, of fine quality, and seems to be prolific.

Windsor Chief is another berry that holds a position below its merits.

The old Wilson I still use to fertilize Crescent, though of late it seems to lack vigor.

Cumberland is a good, productive berry, but too soft for any market more than three or four hours distant.

Haverland, I have not tested sufficiently to form an opinion of it, though it promises well. Same can be said of Itasca and Logan.

Jewell is a flat failure; I have hundreds of plants that have not put out a single runner this year. Besides, the fruit, although bright colored, is of poor quality and soft.

Of the latest sorts, I think Gandy's Pride and Cloud's Seedling, the most promising with me, but to the new beginner I would say, plant Crescent Seedling and Bubach No. 5, with Wilson to fertilize, and test in a small way some others until you find something better. But you will find at the end of the season, that the Crescent has brought in the money to buy the new sorts.

Raspberries.—Of raspberries, the Turner is perfectly hardy, but the berries, like the Crescent, got so small and soft toward the close of the season that were it not so early it would be discarded.

The Cuthbert, we depend on for our main crop of reds. It is not hardy in this latitude, and requires laying down, but with this exception it is by far the best red raspberry we have, and to it we look for our profits, as we do the Crescent among the strawberries.

Though if the Marlboro' does as well in the future as it has in the last two years, it will supersede the Turner, as its season is about the same. The berries are fully as large as the Cuthbert. It is an enormous cropper, though the berries are not as good in quality, and it is perfectly hardy so far, besides it is a stocky grower (something very desirable where you have many acres), and ripens its wood better than any raspberry on our grounds. I consider it a great acquisition, but in my experience it requires rich land, while the Cuthbert does best on land not so rich.

The Shaeffer's Colossal is also hardy; it is a good cropper, but very unmanageable, and the berries are of so bad a color that they do not sell well, and are the only red raspberry I could not ship into Minnesota, though for home market, when they become known, they are taken for canning purposes before others.

Gregg, I rely on for my late black-caps, and have never been disappointed. Last winter we laid down a part of our Greggs, but those that stood up, were loaded as well as those laid down. They are far the finest black-caps we have in my experience, and we raise them by the acre.

Blackberries.—Of blackberries, I have tried only the Snyder, Ancient Briton, Taylor's Prolific, and Kittatinny. The latter is very tender, and must be entirely buried. Taylor is but little hardier. For our main crop, we must plant either Snyder or Ancient Briton, and there is not much choice between them. They both gave me enormous crops; are alike as to hardiness. The Ancient Briton bears well, and the berries are not quite so prone to turn red as the Snyder. Both must be laid down, like Cuthbert raspberries.—CHAS. ROOT, Hopkinton, Iowa.

FRUITS IN IOWA.

The following general remarks are by Jno. Wragg, of Waukee, Iowa:

There was a fair crop of apples in this district, if we consider the great loss of trees of our most popular sorts, in the last ten years, and prices have ruled low. One noticeable

fact, in travels through this part of the State, was the fine crop of Jonathans. When I say fine, I mean by comparison. You well know that the most of the older trees of this favorite sort are dead or badly crippled; but this year, every tree, it seems, that could bear did its best. Grimes' Golden is growing in favor. Pewaukee and Walbridge are both giving fair satisfaction, considering that most of the trees are yet young. On my own grounds, the heaviest bearer of the new varieties was Yellow Transparent.

Plums were an entire failure, except in a few favored locations. The De Soto was the only one that bore on my grounds. I have a very fine experimental orchard of plums now planted, of what are supposed to be the best of our native sorts, and a few of European origin, or crosses. I expect great results in a very few years.

Cherries were a failure, because our people neglected to keep planting. The older trees are all dead, or nearly so, and the failure was so sudden that there were few young trees of bearing age to replace them. The exception to this is the "Wragg." Young trees bore very full of extremely fine fruit, and Mr. Humphrey writes me that the original trees are healthy and productive at twenty-five years of age. I quote from letter of M. J. Graham, of this county, in Horticultural Art Journal for August: "The Wragg is a little larger, later and more productive than the English Morello, and one tree of Wragg at six years old, will produce more than fifty Early Richmonds at same age. I have the trees all growing in same soil and conditions, and speak from experience." I have also planted a small experimental orchard of the Russian cherries. I like the behavior of the trees, but as yet, can say nothing as to their value.

Grapes were fairly good, where taken care of by covering. Mr. Graham has thirty varieties in bearing, and is growing very fine fruit. But he takes good care of his vines.

The Shaeffer is the raspberry for Iowa. Hopkins is also doing well.

SECRETARY'S REPORT FOR IOWA.

BY GEO. VAN HOUTEN, OF LENOX.

The worst fears of the past few years have been realized, in the decline and death of most of the orchards of the State. It is true that in almost every county many trees and some orchards survive; yet in all northern and eastern parts of the State, new orchards must be planted before a sufficient home supply of winter apples can be grown.

I have frequently said that in south-west Iowa, sun-scald was the greatest enemy to successful apple-growing. Some of our close-observing horticulturists now assert that even in the northern part of the State, many varieties will endure the cold and yet cannot endure the sun shining on their trunks. If this theory be true, and I have no doubt but that it is true, there is yet hope for some of the old varieties over a considerable portion of Iowa.

RUSSIAN APPLES.

The discussions so vigorously carried on for the past few years, will no doubt continue, and the reasons are obvious to the thinking man. The various, I may say the conflicting, reports as to hardiness, quality and season of the Russian apple, does not imply dishonesty or necessarily prejudice. We have an extensive country called Iowa; we have considerable difference in latitude and altitude, and a great variety of soils, which, with the different exposures, may account for the different and conflicting reports. The test of experience is being applied, and the evidence both *pro* and *con* is accumulating, and there need be no hurry as to the final verdict.

SEEDLING PRODUCTION.

The amount being done, aggregates enormous proportions, and the results already attained, give hope of ultimate success. President Patten, of this Society, with Professor Budd, Captain Speer and others, are making *special* efforts in that direction; while

nearly every member of our Society is doing considerable, and hundreds of farmers are doing something to aid in the work. Already many seedlings are coming into bearing, and some give promise of decided merit. The marked success of several individuals, in single plantings, is an enchantment, almost, and it is not to be expected that promiscuous planting will be often rewarded with success; yet, by systematic crossing, or more correctly speaking, pollenizing, we may hope for *decided* results; not as marked, of course, as in the breeding of animals, yet with such careful study, as is now being devoted to plant-breeding, we are almost certain of making rapid and steady progress.

CHERRIES.

All the old varieties are proving unsatisfactory and short-lived. The crop was a failure. Many of the new varieties on the Agricultural College Farm bore well, and promise hardy and productive varieties suited to our needs, and will extend the cherry season some weeks, as some are early, some medium to late, and some very late. I have no doubt that as soon as we can get trees of these new varieties, we will have something almost certain to produce fruit every year.

PLUMS.

We now have in Iowa, native varieties of plums that are giving satisfaction, and new candidates for public favor are coming to the notice of horticulturists nearly every year. An important work is now to select and classify as to season, etc.

GRAPES.

Grapes are being grown in great excellence and abundance. With winter protection, which costs but a trifle for each vine, a crop is insured. Iowa could supply the United States in a few years, if we turned our attention to grape production; and yet we import grapes from New York and other States, besides California. I wish to emphasize, that winter protection is essential to a crop many seasons, and the improvement of quality and quantity makes it profitable even in ordinary winters.

SMALL FRUITS.

There is no possible doubt but that small fruits can be successfully grown, and many localities ship large quantities. Winter covering is essential in the north, and will pay, even in the most favored portions of our State. Even the Snyder blackberry, which stands our winters as a rule with little or no apparent injury to canes, will pay in extra yield and quality, the cost of laying down and covering.

WINTER PROTECTION OF GRAPE-VINES.

Care should be taken, too, to save young, vigorous canes, starting at or near the surface of the ground, and not to leave old, rigid stumps or trunks, that cannot be bent down and covered with earth, for upon proper winter protection very largely depends our success in grape-growing. The vines should be laid flat upon the ground, and nothing but the bare earth should come in contact with them. Other covering may be placed over this if desirable. The pruning may be done at any time after the leaves are killed by frost, and the covering may be delayed until just before the ground freezes up. After danger of hard freezing is over in the spring, they should be uncovered, selecting a cloudy day for this work. The uncovering and tying up to the trellis should be done before the buds begin to start, otherwise, many of them will be broken off and destroyed.—O. A. KENYON, McGregor.

DISCUSSION ON BLACKBERRY PROTECTION, ETC.

S. L. Morrison: In laying down blackberries, a spading fork is best to loosen the ground, when the canes can be pushed over with a hay-fork, which can be stuck in the ground and holds the canes down until they are covered.

President W. I. Chamberlain: Mr. Hamilton, of Ripon, Wisconsin, raises Snyder and Ancient Briton. He cuts back the canes and raises fruit instead of a surplus of wood. His success is so remarkable that it does not seem possible to fail when the same methods are pursued.

Prof. Budd: I wish to call attention to a queer mistake. You can find, by looking up the old Wisconsin Horticultural Reports, that this blackberry was named after A. S. Britton, but in some way the name has been perverted, and is now called Ancient Briton. I would like to suggest to the trial stations, that they get the Windom dewberry. The Lucretia is easy to get down, but is hard to get up. Windom trails on the ground like the Lucretia, the first year, but after that stands up, and bearing wood is off of the ground. The Windom is raised by the acre in Minnesota; it is a half-standard, and not really a creeper.

ON THE DEVELOPMENT OF PLANTS AND FRUITS FROM NATIVE FORMS.

BY C. L. WATROUS, OF DES MOINES.

Botanists teach us that the plants of America and those of Europe, once grew and flourished in Greenland and other lands about the pole; that thence they were forced southward by a period of cold, which, in turn, gave way to warmth; and this again to cold, these oscillations being repeated, no man may ever know how many times. Vegetable forms preserved themselves through countless ages of changing conditions, by means of migration to and fro, and by structural modification to suit the varying conditions of their environment. The different influences of each continent have so varied the forms once common to both continents about the north pole, that very few European trees or plants now present enough points of resemblance, to be classed as identical in species, with any Americans. It may be said, in passing that the same law holds good in the animal kingdom. Our trees have been American trees, substantially as they are now, through vast geologic periods. A late author tells us that in the cretaceous rocks of Dakota are found remains of trees familiar to us. There flourished the oak, the beech, the birch, the poplar, and many others; even the apple and the plum were there. So long ago as that time, at least, were there flourishing orchards of American apples and plums on these prairies; perchance there were there also, in those hoary days, millions of ages ago, men who loved fruit and held grave councils about varieties and methods, just, as we do. Talk about Russian thoroughbreds! The oldest of them are of yesterday, compared with these venerable sires. This is an apple country—made so by nature. All botanists agree that trees and plants have great capacity, by means of seedling reproduction and by the survival of the fittest, for modification to suit varying conditions. De Candolle states that our finest fruits have been brought to their high estate within comparatively short periods of intelligent culture and selection, the primitive European apple having been less than one-fourth the size of our largest wild crab.

A valuable paper on the development of native forms of fruit was read by A. S. Fuller, at the last meeting of the American Pomological Society. Among other things, he said that for two hundred years, Americans tried to grow European grapes, never doubting of final success, and so neglecting the hardy native varieties. It is now barely fifty years since our vineyardists became aware that we possessed American grapes worth cultivating. The struggle was long and severe. At the same meeting, one firm was awarded a premium for a display of one hundred and sixty-five varieties of native grapes, and not one foreigner disputed their supremacy.

[A very large proportion of the exhibit of grapes, mentioned by Mr. Fuller, was composed of European hybrids or crosses upon our natives. SECRETARY O. S. H. SOCIETY.]

REPORT FOR EASTERN IOWA.

Strawberries; an excellent crop, with good prices. Crescent Seedling still in the lead; some others did quite well.

Raspberries; an excellent crop, too; Shaeffer's Colossal and Turner yielding immense crops; the former producing the finest berries I have ever seen; would say, plant largely of this sort. Ohio reported behaving quite well in some localities. Gregg best among the cap berries.

Blackberries; a good crop of finely developed fruit; Snyder and Stone's Hardy are the leading varieties; and here allow me to say in behalf of the Stone's Hardy, if they always behave as they did with me this year, it would be difficult to get too many. I almost wished my entire farm was set to them. The crop was simply immense, realizing fifteen cents per quart by the crate. In ripening, they follow the Snyder, which is very desirable. I have been fruiting them for three years; think the fruit preferable to the Snyder; is larger and equal in flavor.

Grapes; with us a good crop; some other localities report short crop; prices ranged from three to five cents per pound. Concord, Worden, and a few others make up the list. Worden, wherever known and planted, is giving good satisfaction; in my opinion, this is destined to lead, in this locality, at least, for two reasons, it is prolific and is of fine quality.

A. COOPER.

BLACKBERRY CULTURE.

BY T. K. BLOOM, OF LISBON.

There are several methods by which a crop of blackberries may be made reasonably sure. One is to plant varieties like the Early Harvest or the Wilson; both of which are of a low habit of growth and have pliable wood, and are therefore easily bent over and covered lightly with earth, and thus protected against the cold, dry, searching winds of winter and early spring. The Early Harvest is a very prolific bearer and a good berry, when properly trimmed or cut back, which can only be done successfully after the fruit spurs appear.

Another good method for varieties like the Snyder, Ancient Briton, Stone's Hardy, etc., is to pull up, about the last of June, all young shoots that have started from the crown, near the surface. New shoots will start from the roots below the crown; and in two seasons, last year and year before, in which we have tried this plan, these second-growth bushes were loaded with fine berries, while the rows alongside of them, not so treated, had but few.

But the last, best and surest method is to plant a variety that will laugh at the winter and smile at the warm sun in February and early March, and when the time comes for ripe berries, will present you a fair crop of fine, luscious fruit, such as the *Wapsie* can boast of for five successive seasons, and which we think will yet spread itself all over Iowa. One more severe test, and it will be sent out on trial, not to make a fortune for the originators, but to bless the people of Iowa, and keep them from cursing nurserymen and berry-growers in general for introducing new varieties which have no merit.

DISCUSSION.

Mr. Kimm: How far apart do you put the plants?

Mr. Bloom: From four to eight feet. I cut the tops off about the last of June.

Mr. Root: I always lay them down for winter. I don't believe any blackberry is hardy otherwise. I picked this year from one-half acre, 3,456 quarts. I like the Ancient Briton better than the Snyder.

Mr. Clemons: When do you set the plants?

Mr. Bloom: As early in the spring as possible.

GRAPES FOR MARKET AND PROFIT.

Following a paper upon Grape Culture, W. O. Willard, of Grinnell, Iowa, says: I would select as the five best varieties, Worden, Concord, Lady, Pocklington, and Moore's Early. I think the Worden best. I prefer one-year-old vines, if strong, to set out. I cut them back to two or three eyes. The Brighton sometimes does not hold its leaves; but usually it does.

Prof. Budd: I consider the Telegraph is No. 3 on the list.

The following extracts from a carefully prepared paper from one of the most intelligent nurserymen and fruit-growers of Iowa, will interest all who are experimenting with the new Russian apples, and may help to form just ideas upon the much agitated question, of their probable value for American planters.

THE DUCHESS OF OLDENBURG APPLE.

BY C. L. WATROUS, OF DES MOINES.

What is the land of its birth-place?

To many men, this will seem an impertinent question, prompted by an excess of heretical doubts, concerning a subject long ago settled. Downing, and after pomologists, attributed the Oldenburg to Russia, and have been followed, without question, by the general public. Moreover, certain late explorers of that country, while not exactly claiming to have found Oldenburg there, have still spoken confidently of having found "the home of the Duchess" in a certain Russian province.

The people of Iowa have lately invested a very great many thousands of dollars in new and high-priced Russians, recommended by those offering them as being as hardy as the Duchess, and a certain number of weeks earlier or later, or, recommended as being a certain per cent. hardier than the Duchess, and therefore more valuable than that Russian.

It has been strenuously urged that in a great country like Russia, there might be reasonably expected other apples as valuable as this one, which has undoubtedly come from there. This was reasonable, provided that only the Duchess, in fact, had come from that country, and it almost seems sinful to doubt, where so much depends on faith. Yet it is more than doubtful whether the apple we know and prize as the Duchess of Oldenburg, is a native of Russia, or was ever cultivated there, outside of the Government Experiment Stations. The writer has received most of the sorts imported by the United States Department of Agriculture, about 1870, also those imported by the Iowa State Horticultural Society, some years later, by its then Secretary. The Oldenburg not appearing among either of these two extensive importations, further search was made.

Having learned from President Berckmans, of the American Pomological Society, that his father had tested some five hundred varieties of apples from the south region of Russia, I applied to him for assistance. In his reply he used these words: "I could throw no light upon the origin of the Duchess of Oldenburg."

A similar letter of anxious inquiry to Mr. P. Barry, of Rochester, New York, whose firm has imported and tested Russian apples many times, and from many sources, brought the following reply: "I am not aware of the Duchess of Oldenburg having been received among importations from Russia. Several of the Russian varieties fruited by us, bear considerable resemblance to the Oldenburg, and are evidently related. The Borovitsky has, I believe, everywhere proved to be Oldenburg. Downing found it so. The colored portrait of Borovitsky, in Lindley's British fruits, in 1841, is Oldenburg. Borovitsky was received by the London Horticultural Society, in 1824, from the public gardens of St. Petersburg, Russia. The Oldenburg is valuable almost everywhere. The fact that the apple was received from the botanical gardens in St. Petersburg is not any evidence of nativity in that country, but rather that it was a stranger, on trial there."

In an interview in the fruit hall at a meeting of the American Pomological Society, at Boston, in 1887, Mr. Charles Gibb, of Canada, who has twice explored extensively in Russia, and is moreover the recognized American authority on Russian nomenclature, said:

"We found at Kazan, the Duchess, if it was the Duchess, of so fine and so mild a quality, that no one could be sure of its identity." He has in his published reports, expressly disclaimed having located our Duchess of Oldenburg in Russia, and in private letters to myself and others, has lately said he could throw no further light on the subject. Neither Mr. Tuttle, of Wisconsin, nor Mr. Weltz, of Ohio, who has lately explored in Russia, under the auspices of the Department of Agriculture, nor yet any other out of the many who have imported scions from Russia, have ever, so far as I am aware, found, or claimed to find, the Oldenburg among their treasures.

The name Oldenburg, points strongly to the little North German Grand Duchy of that name, as the most probable place of its origin. An intelligent gardener in this State has lately stated to the writer that near the boundary of the province of Oldenburg, he knew an apple, called Schlottte by the peasants, which was colored like the Oldenburg, tasted like it, was sour, coarse in flesh, and a good cooker like it, and finally, was much like it in season and growth of trees. All this may be profitably considered in making up a judgment. President Berckmans says that of the five hundred Russian sorts received by his father, the most of them had names of German origin. In his opinion, they were largely seedlings raised by German immigrants to Russia, from seeds of apples from their former German homes. Any list of American importations of apples from Russia betrays the same birth-marks, and leads to the same conclusion. The Oldenburg apple possesses a most wonderful constitutional power of adapting itself to widely differing circumstances; it is almost a cosmopolitan. Its value to us is beyond estimation. But I see no reason for basing any prophecies concerning the future behavior or prospective value of any natives of Russia, upon its well-known reputation.

The constant use of the good reputation of this fruit, coupled with the confident assumption of its undoubted Russian origin, has cost, and is still costing the citizens of this State very dearly, by inducing them to try hosts of unknown Russians, in the hope of finding some of them as valuable here as the Oldenburg. If there exists anywhere any proof that the Oldenburg is a genuine Russian, the believers in the brilliant future of that race of fruits in America will doubtless bring it forward, since nothing less than positive and undisputed evidence can now settle this question in their favor. If this paper shall bring out the evidence, its object will have been fully accomplished.

DISCUSSION.

Mr. Budd: I have seen the original tree, Duchess of Oldenburg, or, rather, a scion taken from that tree. Its home is on the Volga, and we found three hundred varieties of Duchess.

Mr. Watrous: Mr Gibb said, "we did not see the Duchess in Russia, but we found many trees and apples similar to it, but not the same."

President Patten: The first thing that led me to question the generally received opinion that this apple was a Russian, was the fact that seedlings from this apple differed so much from each other; as much even as do the seedlings of any of our American apples. The Russian apples, having grown for a long time in the same locality, usually nearly reproduce themselves in their seedlings. I do not consider the Yellow Transparent more than half as hardy as the Duchess. As a rule, the apples which have come from Russia are not very successful in this country. It is claimed that the Duchess came from Russia, and as it is extremely hardy, therefore we might reasonably expect to find other hardy varieties from the same country. But it is my belief that this apple did not originate in Russia, and so with me, this argument wholly fails.

HORTICULTURAL INSTITUTE WORK.

BY C. L. WATROUS, DES MOINES.

If farmers' institutes are desirable at all, it seems not a difficult task to show that a horticultural department is quite as necessary as any other.

There is probably no other subject resting so near to all our daily lives, upon which there is such a general lack of intelligence, as upon that embraced under the generic term, Horticulture.

Business men are not ashamed to say they know nothing about such matters, who would be ashamed to confess ignorance upon other subjects of far less importance to health and comfort of living.

Yastly more of the physical prosperity and well-being of a people, depends upon its food than is generally imagined. A highly organized, nervous, active people, require to be more generously and healthfully nourished than a half-savage one, in order to maintain reasonable health under such incessant strain.

Our people have especial need to be taught, through farmers' institutes, the vital importance of abundant fruit, to maintain the health and vigor of their families, but also to be taught the common rules about planting, cultivating, gathering, preserving, storing and preparing for the table, all the fruits desirable and capable of successful cultivation in the various regions of our commonwealth.

The great importance of such teaching, upon the health and comfort of this, especially upon the rising generation, can scarcely be over-estimated.

Moreover, these institutes could be made of immense value, by dispensing knowledge, that would strongly tend to prevent much of the fraud, now practiced by conscienceless vendors of worthless or ill-adapted trees and plants.

These sinners find ready victims to the most preposterous impositions, because, when one knows nothing about the subject, a lie is just as credible as the truth, and goes far better, in selling at high prices, most wonderful trees and plants from foreign lands, or other distant parts; grape-vine raspberries, got by grafting a raspberry upon a honeysuckle, and producing fruit of wonderful succulence and size, growing on thornless stems; ever-bearing mulberries from Russia, that bear two crops in summer, and a third in winter, if transplanted into fresh soil in a cellar; apple trees, budded on French crab stocks, thereby being rendered blight-proof, borer-proof and iron-clad against any degree of cold or heat, while bearing fruit in unlimited quantities, and of a quality beyond compare; all these, and many other equally preposterous frauds, have found, and still find, plenty of faithful believers, who are willing to risk their money on their faith. The amounts of cash drained from hard workers, ill able to lose it, would foot up something enormous, if known.

Very few men are aware of the fact that a tree or plant, if really a great success in any distant locality, is, for that reason, much less likely to succeed with them, because individual trees and plants have very little power of adaptation to different circumstances. Few people know, or stop to think, that a tree, propagated by grafting or budding, has less power of adapting itself to changed conditions than a plant reproduced locally from seed, and this lack of knowledge costs us dearly every year.

Some elementary instruction should also be imparted, at these institutes, upon the important subjects of seedling production and selection, because it is a fact that every fruitful region known to man has had its especial type of fruits fixed by seedling production in that especial region. And these special regions are far less extensive, individually, than is usually supposed.

Another great subject would also naturally be urged in these institutes. I mean the moral and material benefits to be derived from planting about the home, for shade in summer, shelter in winter, and beauty and comfort at all times.

No tongue or pen can tell the inestimable benefit, to the rising generation, of beau-

tiful homes in the country, near the healthful and softening play of nature's health-giving processes. Great cities are moral and physical destroyers, constantly fed by the best blood and brain from the country, on pain of depopulation otherwise.

FRUIT LIST FOR WESTERN IOWA.

APPLES.

Summer—Duchess. For home use, Whitney, Red June, Early Joe. For trial, Grand Sultan, Thaler, Yellow Transparent.

Fall—Lowell, Coles' Quince, Wealthy, Fameuse, Fall Orange. For trial, Longfield.

Winter—Jonathan, Grimes' Golden, Winesap, Janet, Roman Stem, Ben Davis, Iowa Blush. For trial, Antonovka.

Crab Apples—Alaska, Hyslop, Soulard.

CHERRIES—Early Richmond, Late Richmond, English Morello. For trial, Wragg.

PLUMS—Wild Goose, Forest Garden, Miner, De Soto, Wolf. For trial, Hawkeye, Potawattamie, Wyant, Baldwin.

CURRENTS—Cherry, White Grape, Fay, Victoria, Red Dutch.

GRAPES—Moore's Early, Worden, Concord, Lady. For trial, Niagara.

RASPBERRIES—Turner, Cuthbert, Gregg, Shaeffer, Ohio, Tyler.

STRAWBERRIES—Crescent, Chas. Downing. To fertilize, Crescent, Capt. Jack. For trial, Bubach No. 5, Warfield No. 2.

BLACKBERRY—Snyder.

DEWBERRIES—For trial, Lucretia, Windom.

PROPAGATION BY CUTTINGS.

In propagating by budding, grafting and cuttings, we have violated one of nature's laws, by separating that bud scion or cutting from its parent stock, and to succeed in making them grow, we must get back as nearly as possible to Nature's plan of supporting life and producing plant growth in them, hence the bud must be inserted in an opening in the bark next to the cambium layer of the stalk, to which it is to become adherent, when the layer is doing its active work. So, in grafting, the scion must be inserted in the wood, when Nature is ready to begin, or has begun, her work of reproduction.

In propagating plants by cuttings, we must observe the same laws. Cuttings of the grape or currant may be made late in the fall or very early winter, before hard freezing, and they should be kept in nearly the same condition as when they were made, though currants can be put out in the fall, but should be well mulched through the winter.

Grape cuttings of two or three buds should be tied in bundles and placed bottom end upward in a trench dug so deep and covered so well as to be beyond frost, and as soon as the frost leaves the ground in the spring, the covering should be removed to within an inch of the cuttings, so that the soil in contact with them may receive the warmth of the sun. When the soil has become warmed to a sufficient depth they may be planted in rows a few inches apart in the row, care being taken to press the earth firmly about the base of the cutting, and it should be as light as possible about the top, and the cutting should be inserted in the earth to the base of the top bud. A mulch or a board should be applied to each side of the row to keep the ground moist till the vines have made a good start.

GENERAL FRUIT LIST FOR NORTHERN IOWA.

APPLES.

For general planting—Tetofsky, Duchess, Whitney, Wealthy.

In favorable locations—Talman Sweet, Gros Pommier and Fameuse.

For trial—Patten's Greening and Harry Kaump.

For top working on suitable stocks—Fameuse, Wealthy, Golden Russet and Sweet Pear.

CRABS.

For General Planting—Early Strawberry, Briars Sweet, Martha, Virginia Winter, Richland Winter, Sweet, Minnesota and Alaska.

PLUMS.

De Soto and Wolf. *For trial*—Rockford.

GRAPES.

Moore's Early, Worden and Concord.

CURRANTS.

White Grape, White Dutch, Victoria and Long Bunch Holland. *For trial*—Fay's Prolific.

GOOSEBERRIES.

American Seedling, Hazleton and Mountain Seedling. *For trial*—Downing.

RASPBERRIES.

Red—Turner and Shaeffer's Colossal.

Black—Tyler, Ohio, Gregg, Briton and Pitt's Seedling.

BLACKBERRIES.

(Covered in winter) Snyder, Briton and Stone's Hardy.

STRAWBERRIES.

Crescent, Wilson, Red Jacket, Green Prolific and Windom.

DEWBERRIES.

For trial—Lucretia and Windom.

OFFICERS AND MEMBERS

OF THE

OHIO STATE HORTICULTURAL SOCIETY,

FOR THE YEAR 1889.

*HOSMER G. TRYON, *President*..... Willoughby.
 †GEO. W. CAMPBELL, *Vice-President*..... Delaware.
 W. W. FARNSWORTH, *Secretary* Waterville.
 N. H. ALBAUGH, *Treasurer* Tadmor.

AD INTERIM COMMITTEE, WITH ABOVE OFFICERS.

GEO. M. HIGH..... Middle Bass, Ottawa Co.
 MATTHEW CRAWFORD..... Cuyahoga Falls, Summit Co.
 F. R. PALMER..... Mansfield, Richland Co.
 THEO. F. LONGENECKER..... Dayton, Montgomery Co.
 JAS. EDGERTON Barnesville, Belmont Co.
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 HENRY YOUNG Ada, Hardin Co.
 NELSON COX Bradrick, Lawrence Co.
 S. H. HURST..... Chillicothe, Ross Co.
 S. R. MOORE..... Zanesville, Muskingum Co.

* Deceased, April 29, 1889. GEO. W. CAMPBELL, of Delaware, Ohio, elected by the Society to fill
 unexpired term of President.

† S. R. MOORE elected Vice-President for unexpired term.

LIST OF MEMBERS.

Name.	Post-office address.	County.
Adams, Rev. G. A.....	Perrysburg.....	Wood.
Adams, Frederick W.....	Warren.....	Trumbull.
Albaugh, B. F.....	Covington.....	Miami.
Albaugh, N. H.....	Tadmor.....	Montgomery.
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Ames, Luther.....	Weston.....	Wood.
Barringer Willard.....	Dayton.....	Montgomery.
Bear, S. B.....	Dayton.....	Montgomery.
Beaver, John F.....	Dayton.....	Montgomery.
Beebe, Horace Y. (deceased).....	Ravenna.....	Portage.
Breece, M. W.....	Delaware.....	Delaware.
Bement, Samuel.....	Toledo.....	Lucas.
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Cahoon, J. M.....	North Dover.....	Cuyahoga.
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Cox, Nelson.....	Bradrick.....	Lawrence.
Crawford, M.....	Cuyahoga Falls.....	Summit.
Crawford, W. S.....	Cuyahoga Falls.....	Summit.
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Cunningham, John.....	Ada.....	Hardin.
Cushman, E. H.....	Euclid.....	Cuyahoga.
Cushman, H.....	Euclid.....	Cuyahoga.
Davis, Joseph.....	Brandt.....	Miami.
Devol, W. S.....	Columbus.....	Franklin.
Donipace, Jas.....	Perrysburg.....	Wood.
Duer, Daniel.....	Millersburg.....	Holmes.
Eccles, W. H.....	Urbana.....	Champaign.
Edgerton, Jas.....	Barnesville.....	Belmont.
Farnsworth, W. W.....	Waterville.....	Lucas.
Fogg, Waldo.....	Salem Center.....	Meigs.
Ford, Frank.....	Ravenna.....	Portage.
Freeman, Isaac.....	Rex.....	Miami.
Fulwiler, Geo.....	Dayton.....	Montgomery.
Geib, Peter, 1692 Summit street.....	Cleveland.....	Cuyahoga.
Graham, W. A.....	Zanesville.....	Muskingum.
Green, W. J.....	Columbus.....	Franklin.
Harris, W. C.....	Toledo.....	Lucas.
Harrison, J. J.....	Painesville.....	Lake.
High, George M.....	Middle Bass.....	Ottawa.
Holderman, Simon.....	Kingston.....	Ross.
Hurst, J. R.....	Chillicothe.....	Ross.
Hunt, R. A.....	Euclid.....	Cuyahoga.
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Innis, M. P.....	Columbus.....	Franklin.
Irons, Samuel.....	Lebanon.....	Warren.

LIST OF MEMBERS—Continued.

Name.	Post-office address.	County.
Irwin, W. N.....	South Salem.....	Ross.
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Kramer, S. R.....	Gahanna.....	Franklin.
Kramer, Wm.....	Dayton.....	Montgomery.
Lauppe, Chas.....	Urbana.....	Champaign.
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Lehman, H. J.....	West Milton.....	Miami.
Lazenby, W. R.....	O. S. U., Columbus.....	Franklin.
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Longenecker, Theo.....	Dayton.....	Montgomery.
Madison, Joseph.....	Chillicothe.....	Ross.
Mason, Dr. A. B.....	Auburndale.....	Lucas.
Miller, Daniel J.....	Saltillo.....	Holmes.
Miller, F. C.....	New Philadelphia.....	Tuscarawas.
Miller, Wm.....	Gypsum.....	Ottawa.
Munger, Timothy.....	Covington.....	Miami.
McAdams, Newton.....	Columbus Grove.....	Putnam.
Moore, N. and Son.....	Toledo.....	Lucas.
Myers, Clinton.....	Miamisburg.....	Montgomery.
Newton, G. F.....	Millersburg.....	Holmes.
Newell, A. F.....	Warren.....	Trumbull.
Nicol, A. M.....	Granville.....	Licking.
Nickerson, Joshua.....	New Burlington.....	Clinton.
Notestein, J. B.....	Canaan.....	Wayne.
Neisz, J. K.....	Mt. Union.....	Stark.
Ohmer, N.....	Dayton.....	Montgomery.
Palmer, F. R.....	Mansfield.....	Richland.
Pentland, F.....	Lockland.....	Hamilton.
Perkins, Jacob.....	Warren.....	Trumbull.
Perry, Wm. L.....	Covington.....	Miami.
Pinkham, W. C.....	Loveland.....	Clermont.
Pierce, L. B.....	Tallmadge.....	Summit.
Picket, G. S.....	Clyde.....	Sandusky.
Pfrimmer, Jacob.....	Milford.....	Clermont.
Ragan, Wm. H.....	Greencastle, Ind.....	Putnam.
Reid, E. W.....	Bridgeport.....	Belmont.
Rhoads, Emmet V.....	St. Paris.....	Champaign.
Riddle, Dr. S.....	Ashland.....	Ashland.
Shinkle, G. W.....	Hamersville.....	Brown.
Smith, C. D.....	Lancaster.....	Fairfield.
Stacey, Will E.....	Lyons, Ind.....	Greene.
Stein, John C.....	Piqua.....	Miami.
Simmons, J. W.....	Casstown.....	Miami.
Stull, John M.....	Warren.....	Trumbull.
Sonder, W. P., 828 Lenk street.....	Toledo.....	Lucas.
Snider, J. S.....	Lancaster.....	Fairfield.
Steele, R. W.....	Dayton.....	Montgomery.
Ströeper, J. P.....	Chillicothe.....	Ross.
Swallow, J. L.....	Jamton.....	Montgomery.
Scott, Evert H.....	Ann Arbor, Mich.....	Washtenaw.
Stoppleman, Jno H.....	Dayton.....	Montgomery.
Taylor, W. H. L.....	Urbana.....	Champaign.
Townsend, George.....	Gordon.....	Darke.
Tracy, W. A.....	Toledo.....	Lucas.
Tryon, J. H.....	Willoughby.....	Lake.
Trowbridge, G. W.....	Glendale.....	Hamilton.
Tryon, H. G. (deceased).....	Willoughby.....	Lake.
Thompson, M. T.....	East Rockport.....	Cuyahoga.

LIST OF MEMBERS—Concluded.

Name.	Post-office address.	County.
Weed, Clarence M.....	Columbus.....	Franklin.
Weltz, Leo.....	Wilmington.....	Clinton.
Whitney, C. L.....	Warren.....	Trumbull.
Wilson, Horace.....	Columbus.....	Franklin.
Withoft, Fred. G.....	Dayton.....	Montgomery.
Wyss, Daniel.....	New Philadelphia.....	Tuscarawas.
Waid, C. H.....	Emery.....	Fulton.
Young, Henry.....	Ada..	Hardin.

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